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MANAGEMENT OF COMMODITY RESOURCES IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT:

SOCIAL IMPACTS OF MINING

Papers presented at the Asian/Pacific Workshop on Managing the Social Impacts of Mining Bandung, Indonesia, 14-15 October 1996

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INTRODUCTION

The Asian/Pacific Workshop on Managing the Social Impacts of Mining was held on 14 and 15 October 1996 in Bandung at the Manpower Development Centre for Mines of the Ministry of Mines and Energy of Indonesia. It was jointly organized and sponsored by the Manpower Development Centre, the United Nations Conference on Trade and Development (UNCTAD), the East-West Center, and the Mining and Environment Institute of Queen's University. P.T. Kaltim Prima Coal generously covered local costs. The workshop was attended by about 60 participants, mainly from government authorities and mining companies in Indonesia.

The workshop took place against a background of increasing attention to the social impacts of mining, both in developing and developed countries, and a growing recognition that the task of assessing social impacts and devising solutions that take the needs and aspirations of local communities into account is posing difficult challenges for national governments, mining companies and international organizations. National governments may not have the ability to anticipate all the consequences of large mining projects and the requirements of such projects in terms of human and natural resources. International mining companies, even with all their technical sophistication and experience, often do not fully understand the implications of a mining project for the people living in the area. Local communities, finally, often do not have a clear understanding of the vast changes to their lives that may occur as a result of mineral development. The need for innovative ideas and constructive engagement by all the parties concerned is clear, as is the need for methodological development and improvement of communication among parties. The workshop attempted to take stock of recent experiences, assess methods and identify approaches to solving the problems associated with the social impacts of mining.

The programme of the workshop was divided into eight sessions organized around presentations by the resource persons (see annex for the detailed programme). The resource persons were Kathleen Anderson, Director, Mining and Environment Institute, Queen's University, Canada; Dr. Allen L. Clark, Deputy Director, East-West Center, Honolulu, Hawaii; Dr. Jennifer Cook Clark, Law Offices of Jennifer Cook Clark, Kailua, Hawaii; Dr. C. George Miller, President, the Mining Association of Canada; and Olle Östensson, Economic Affairs Officer, UNCTAD. For the purposes of the present publication, the papers presented have been organized into three sections: Background, Analysing and Mitigating Social Impacts, and Designing and Implementing Solutions. In addition to the papers actually presented at the workshop, a paper by two of the resource persons - "An integrated methodology for assessing the social and cultural impact of mining", by Allen L. Clark and Jennifer Cook Clark - has been included since it contains suggestions and advice which may prove helpful to the various institutions that have to deal with the problems posed by the social impacts of mining. Most of the papers were slightly expanded and edited after the workshop in order to make them more easily accessible to a wider audience. The views expressed in the papers are those of the authors and do not necessarily represent the views of the UNCTAD secretariat.

The UNCTAD secretariat would like to take this opportunity to express its thanks to the other organizers and sponsors and to the participants in the workshop for their efforts and for their cooperation.

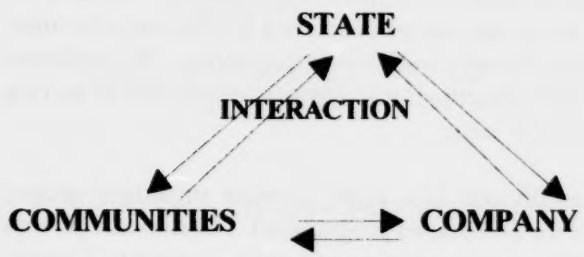
A. BACKGROUND

A brief background on social issues and mining
Olle Östensson, UNCTAD

1. The evolution of the relationships between the State, companies and communities

It is common practice to discuss social issues pertaining to mining in the light of an analysis of the relationships between the three major "stakeholders", that is the State, companies and local communities. Figure 1 shows a schematic view of these relationships. It could be argued that the addition of a fourth stakeholder - non-governmental organizations (NGOs) active in the social and environmental field - would provide a more accurate picture of present realities. However, NGOs commonly act as representatives of local communities, and while the source of their legitimacy is not to be found in the provisions of the formal political process, they may often be thought of as articulating the concerns of those communities. They might also be considered to be included in the "civil society" which forms a general background to all discussion of social issues.

Figure 1 Schematic view of relationships



Recent social and economic trends, together with a general movement towards deregulation and liberalization, have had far-reaching consequences for the way in which the relationships between the State, companies and local communities in the context of mining are viewed. Although the consequences of these trends will be addressed later in this paper, it might be useful first to consider how the nature of the relationships and of the interaction between the three parties have changed over time.

Historically, the legitimacy of the State's interest in the mineral sector was not questioned. Indeed, regulation of mining and appropriation of the values resulting from it are among the earliest recorded activities of the State, and many States were built on mineral wealth. State or Crown ownership of mineral resources was the rule before the industrial era, and the State usually also operated the mines. Mineral wealth was one of the foundations of state power and it was also one of the most important sources of military power. Privately owned mining enterprises were rare and usually confined to low-value minerals. Concerns about the interests of local communities were limited, except in so far as they were seen as a ready source of labour for the mines. The following quotation provides an insight into how the problem of ensuring an adequate labour supply for mines was approached in the fourteenth century in Europe:

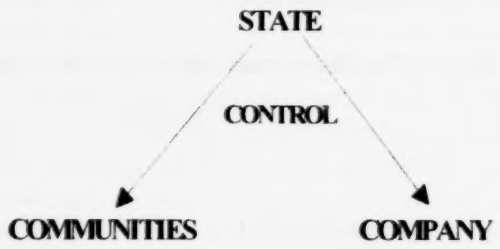
> "First we decide, and promise all those that come to the mining area intending to remain there, that they shall be wholly free in both life and goods for any misdeed

that they have done before, unless they be murderers, thieves or traitors."[1]

Figure 2 illustrates the relationships between the different parties before industrialization, with the most important relationship being the State's control over both companies and communities.

Following the advent of industrialization, the State in most developed countries retained specific prerogatives and authority with regard to mining, more so than in the case of other industries. Many of the institutions thus established have remained in place, according the mining industry a somewhat unique position in the formulation and implementation of government policies[2].

Figure 2 Before industrialization



However, the importance accorded to the mineral sector by developed country governments has tended to diminish along with the sector's share of total production. In most developed countries, possibly excluding Australia and Canada, where the mineral sector is of larger overall economic importance than in other developed countries, the role of the State with regard to the mining industry has come to be seen as in principle no different from its role with regard to other industries. Nevertheless, there are remaining differences in treatment of this industry, which are largely due to traditions of detailed regulation, the need to regulate the rights to mineral finds which justifies the existence of separate mineral resources legislation, and specific environmental regulations. The role of the State with regard to mining has thus come to be mainly seen as a regulatory one.

As regards the interests of communities, during most of the industrialization period it was assumed that these would be adequately protected through the formal political process. Local communities affected by mining were not perceived as having any specific needs, and it was generally taken for granted that mining companies would provide basic amenities such as housing and, often, commercial services. In the second half of this century, however, companies in industrialized countries gradually divested themselves of their responsibilities in this respect, as the overall social and commercial infrastructure developed and eventually came to include the often remote areas where mining was the predominant economic activity. Figure 3 illustrates the relationships between the State, companies and local communities in industrialized countries during

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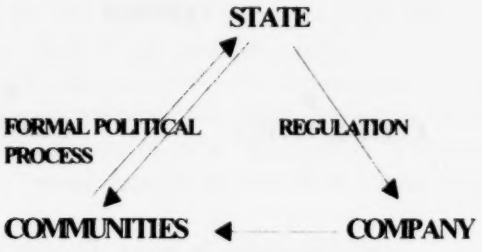
[1] Letter of privilege by King Magnus Eriksson of Sweden for the Western Mining Area in the province of Närke, 1340, quoted in T. Söderberg: *Stora Kopparberget under medeltiden och Gustav Vasa*, Stockholm, 1932, author's translation.

[2] Most countries still apply the "regalian" principle in their mining laws - that is, ownership of mineral deposits are vested in the State. Among countries with any significant mining, the regime of non-separation of rights or "common law" regime, whereby underground rights are held by the surface landowner, prevails in Ireland, the United Kingdom and the United States (although gold and silver are excluded in the former two countries). It should be noted, however, that the rights to deposits of some non-metallic minerals, particularly basic construction materials such as stone, sand and gravel, belong to the landowner in many countries.

most of the twentieth century.

In developing countries, perceptions of the relationship between the State, companies and local communities have changed more rapidly, and in some ways more fundamentally, than in industrialized countries over the last couple of decades. Although developments have differed among individual countries and regions, mainly as a result of different historical circumstances, in particular the time at which they achieved independence from colonial powers, some broad trends are nevertheless discernible.

Figure 3 The 20th century, industrialized countries

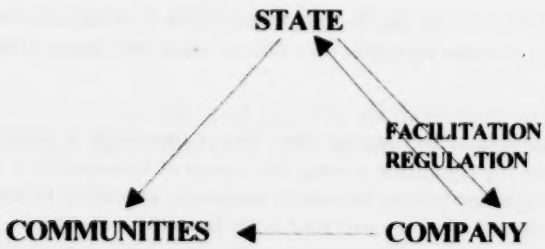


In colonial Africa and Asia, mining was usually the subject of detailed regulation, but the role of the State was seen to be mainly to ensure that the colonial territory was kept open for prospecting and mining, and it was not envisaged that the State itself might wish to participate in the exploitation of minerals or to initiate a strategy for their development in terms of its overall planning objectives. Local communities, of course, had neither direct nor indirect influence on the policies pursued.

In several Latin American countries, most of which became independent earlier, the domestic private sector had a strong position in mining in the nineteenth and early twentieth centuries. Foreign direct investment, particularly by North American companies, became important after the Second World War. Throughout this period, the role of the State was limited - in contrast to the situation under colonialism. Local communities were generally not able to exercise any influence over decisions that often had a major impact on their lifestyles, occupations and culture.

As was the case in developed countries, mining companies in developing countries were expected to provide basic social and commercial services to their employees. While it is obvious that working conditions varied widely and were often harsh, it is also clear that the provision of these services often helped the mining companies to attract labour, and that in some cases viable communities were established as a result. These communities were of course usually subject to the control of companies with regard to their political and social processes. Figure 4 depicts the relationships between the parties under colonialism, and would generally be valid also for most Latin American contries during the first half of the twentieth century.

Figure 4 The 20th century, colonies

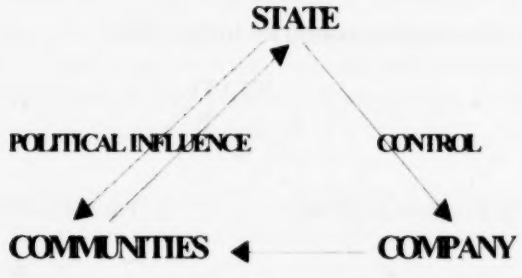


In the 1960s and 1970s, the idea of a strong public sector in developing economies became predominant. Most developing countries gave priority to the objective of economic independence, as an extension of the struggle for political independence from former colonial powers. While this in itself did not necessarily

imply a strong role for the State, governments were, however, also influenced by the economic ideas of the time, which largely developed from experiences in Latin America. The prevalent view of economic development was strongly influenced by the phenomenon of structural deterioration in the terms of trade between countries that export primary products and those that export manufactured goods. It was argued that the benefits of international trade were unequally divided and would lead to the impoverishment of countries exporting primary products. Industrialization on a national basis, guided by the State, was seen as the only policy that could break economic dependence. Import-substituting industrialization and resource-based industrialization - as alternatives or as complementary strategies - were expected to lead to the eventual establishment of diversified and competitive industrial sectors. The State had to take an active role in this development, as domestic private industry was small and poor in capital and technology. Accordingly, the State had to operate both as formulator of planning objectives, since economic thinking was strongly influenced by ideas of central planning and the development process was seen as something that should be planned, and as executor of industrialization policies. The mineral sector was seen as an engine of growth and a base for industrialization, and because of its strategic importance in the industrialization process it became a priority object of state control.

As a result, most developing countries strengthened the role of the State through nationalizations and creation of new state-owned companies, increased taxation and attempts to obtain improved prices through collective action. State ownership of minerals in the ground became the rule where this was not already the case, and direct state participation in mining increased.

Figure 5 Developing countries in the 1970s



Local communities in mining areas were often relatively privileged compared with the rest of the population, since they often had higher incomes and better access to health and educational services. Almost without exception, nationalized or newly established state-owned mining companies followed the earlier practice of providing basic services. This often reinforced the differences in living standards between inhabitants of mining communities and the people in surrounding areas, sometimes creating "enclaves of prosperity". In some cases, because of their position as employees of an industry earning a major share of export income, local communities also had considerable political leverage and were therefore able to protect their relatively privileged position[3]. Figure 5 illustrates the relevant relationships.

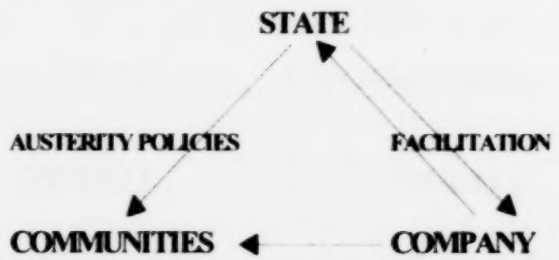
[3] Extreme examples of this include countries with state-owned mining enterprises which were of critical importance to the economy, and where a clientelist redistribution of rent in the form of both income and social services occurred (see O. Bomsel: *The Future of Mining Countries: New Strategies or the Restructuring of the State?*, consultant's report prepared for UNCTAD (UNCTAD/COM/29), Geneva, 1994).

In the early 1980s, the pendulum swung in the other direction[4]. The international debt crisis, combined with deterioration in developing countries' terms of trade, had a serious negative impact on their external accounts. In addition, deep recessions resulting from these external shocks reduced the volume of tax earnings. Most governments had to implement severe austerity policies as part of structural adjustment programmes and, in the process, were forced to reconsider the role of the State. Furthermore, the results of the earlier assertive policies had often been disappointing. State-owned enterprises had frequently turned out to be incapable of generating the expected large profits; ambitious tax schemes had deterred the foreign investment that was sought as a complement to the state-owned mineral companies; and collective action to raise commodity prices had generally failed. Increased external indebtedness forced developing countries to increase exports in order to service debts. Since the necessary capital for investment in export industries could not be raised domestically, it became necessary to attract foreign investment and conditions had to be made more favourable to investors. Beginning in the 1990s, state-owned enterprises in many countries were privatized, partly to reduce fiscal deficits and partly because their economic performance had not been satisfactory[5].

The consequences for local communities of this process were often dramatic. Reductions in employment and income led to deteriorating living conditions in many mining communities. New investors were often unwilling to continue the previous practice regarding provision of services, and this led to further reductions in real living standards. Owing to the austerity policies, general employment usually contracted, which meant that there were few alternative employment opportunities for retrenched mine workers. As a result of privatizations, many communities also lost their direct line of communication with the national government and their national political influence was diminished at the same time as trade unions were weakened.

The economic environment that has emerged from this "rebalancing" process is one where developed and developing countries alike are anxious to attract foreign investment in mining, and have to design their policies with this objective in mind. Accordingly, the last decade has been one of reshaping of policies in this direction

Figure 6 Developing countries in the 1980s



[4] It should be noted that the description of developments in developing countries in what follows may not apply fully to all developing countries. China and India are notable exceptions to the trends described.

[5] During the period from 1975 to 1993, only a few privatizations of mining companies took place in developing countries. Examples include reductions in the State's share in the Companhia Vale Rio Doce (CVRD), which produces mainly iron ore, but has interests also in manganese, bauxite/alumina/aluminium and gold production in Brazil, and privatizations of minority state holdings in copper companies in Mexico. More ambitious privatization programmes have been presented since 1993, although in many cases they have not yet been implemented. Some of these concern major producers such as CVRD in Brazil, Zambia Consolidated Copper Mines Limited (ZCCM) in Zambia (copper) and P.T. Tambang Timah in Indonesia (tin; partial privatization). The only major programme for privatization of state-held mining companies that has so far been successfully implemented is the one in Peru. The Peruvian privatization programme, which has relied on an international bidding process, has been part of a much broader economic reform programme aimed *inter alia* at restoring investor confidence in the country.

and of legislative changes aimed at improving the attractiveness of mineral investment. During the period from the mid-1980s to 1994, over 75 countries adopted new mineral laws, made major revisions to existing laws or were working on draft legislation [6]. In many cases, because of the emergence of "new" issues, the scope of the legislative changes went beyond that of the need to respond to the concerns of foreign investors, and included ways of dealing with new challenges. These challenges are described in the following section.

2. Challenges

In the present economic and social environment, governments continue to face the traditional problems associated with maximizing the contribution of the mineral sector to development. These problems include the need to maintain macroeconomic stability in the face of fluctuating demand for and prices of mineral products, and to devise trade and industrial policies that support the establishment of linkages between the mineral sector and other sectors of the economy in order to promote diversification and broader-based economic development. Governments have to formulate policies that address these problems while ensuring that foreign investment can be attracted to finance the development of mineral deposits.

Governments also have to formulate policies that respond to issues that are often new to them. These include developing and implementing policies that ensure good environmental management in the mining industry, and policies that address the social impacts of mining. In a situation where mining companies are reluctant to assume responsibility for providing social services to the local population, as has proved to be the case with many state-owned companies about to be privatized, solutions have to be worked out that are acceptable both to foreign investors and to the local communities concerned. Companies can no longer be counted on - if they could ever be counted on - to take on the responsibility for the long-term social and economic development of a region. That responsibility has to rest with government, in cooperation with the investor and the local communities.

The social implications of mining projects and the need to accommodate the interests of local communities have received rapidly increasing attention in recent years. There are a number of reasons for this. One reason is, of course, the economic and political transformation that is taking place in many developing countries. This transformation has gathered speed in recent years, and poses problems of adjustment to new economic and political realities. A second reason is that the reforms undertaken in many countries in order to enhance the attractiveness of mineral investment has led to increased investor interest. Several countries which earlier had seen very little foreign investment in mining have been targeted for exploration by mining companies, exploration which has sometimes resulted in new mining projects. Since many of these projects are of medium size with a relatively short lead time from initiation of the project to the start of production, governments have been confronted with the social impacts of mining at short notice, and have had little time to develop policies appropriate to their social circumstances. A third reason is the increased availability of information and of avenues of communication, which often turns local issues into

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[6] According to a list compiled in February 1994 by the Centre for Petroleum and Mineral Law and Policy, University of Dundee, United Kingdom (see UNCTAD *World Investment Report* (UNCTAD/DTCI/10), New York and Geneva, 1994, p. 300).

topics of international debate and brings global public opinion to bear on local problems. Examples include the international attention accorded to events such as the conflict on Bougainville in Papua New Guinea[7] and the dispute over the Coronation Hill project in Australia[8]. A fourth reason is increasing populations and greater demands on scarce natural resources, particularly land, which necessitate an often difficult weighing of local interests and requirements against national - or even global - ones.

Two issues are at the heart of the relationship between government, local communities and companies: population movements and the distribution of benefits and authority.

Large-scale mining projects often lead to major population movements, within an area if they are located in densely populated regions, or to the area if they are in remote, sparsely populated regions. While the direct employment effects may often be negligible, since modern large-scale mining uses similar technologies wherever in the world a project may be located and tends to be very capital-intensive, the indirect employment effects are often much greater, particularly in countries where there are few formal employment opportunities and where labour productivity in most occupations is low. Thus, the local revenue generated by a mining project will tend to attract large numbers of people into occupations that depend on the project. Whether the project is located in a remote area or in an area with high population density, traditional lifestyles and occupations may be at risk as a result. Small-scale artisanal mining has led to even larger population movements, particularly in Africa and Latin America[9]. It is well known that these population movements often pose even greater problems and risks to local communities.

The distribution of authority and of benefits among the various parties involved is another issue that has to be addressed in the context of social impacts. The distribution of tasks and income between central, regional and local levels of government is particularly important in this regard. In practice, the burden of ensuring that mutually acceptable solutions are not only identified but also implemented often falls on regional and local governments, which may not be very well equipped to handle the problems, and which may in fact have limited formal authority to deal with them. As a result, conflicts may develop because of the inability of the local government to address the social problems or over the sharing of benefits. The experience of Bougainville illustrates these problems.

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[7] In 1988, an armed rebellion against the central government broke out on the island of Bougainville in Papua New Guinea. The dispute arose from adverse effects resulting from the operations of Bougainville Copper Pty. Ltd., which was mining a large copper deposit on the island. The grievances of the local population included destruction of the environment resulting in damage to fisheries and agriculture, displacement of the population and insufficient compensation. In 1990, the mine was closed down, and there is at present no prospect of its reopening. For a discussion of the complex roots of the conflict, see the paper by Allen L. Clark and Jennifer Cook Clark in the present publication as well as Thompson, H., The economic causes and consequences of the Bougainville crisis, *Resources Policy*, March 1991.

[8] In 1991, the Australian Government decided to prohibit mining at Coronation Hill in the Northern Territory, where a consortium planned to develop a gold/platinum/palladium deposit. The decision was taken against a background of claims by the Jawoyn Aboriginal people that the site was sacred. Considerable discussion arose over both the accuracy of the claim and the implications with regard to sovereign risk.

[9] According to World Bank estimates, about 1 million people are occupied in small-scale artisanal minng in sub-Saharan Africa (see World Bank: *Strategy for African Mining*, World Bank Technical Paper No. 181, Washington, D.C., 1992).

Thus, the appropriate degree to which decision-making should be decentralized needs to be established in view of both the capabilities of lower levels of government and their familiarity with local conditions. Similarly, in most cases it will be necessary to ensure that the distribution of tax income and other revenues from mining projects is seen as equitable not only by the central government and the company involved but also by the lower levels of government and the local communities. In many cases, it will also be necessary to establish local administrative structures that will ensure that the income is spent in a manner that is sustainable and is commensurate with the expressed requirements of local communities.

3. The way forward

A large amount of serious work has been done in recent years on developing techniques and methodologies for identifying solutions that are of mutual benefit to all the parties involved in mining projects. A large portion of the work has been done by mining companies, but individual governments, NGOs and intergovernmental organizations have also contributed in the context of development cooperation programmes. There are several examples of very successful programmes, some of which are described in the present volume of papers. They all arise from a recognition that the problems need to be addressed in a context of partnership between government, companies and local communities. This partnership has to be based on mutual recognition of the objectives and values of the different parties involved and a shared will to work towards achievement of the overall objectives of maximizing the opportunities for social and economic development, ensuring an equitable distribution of benefits and promoting political stability.

An assessment of social and cultural issues at the Bougainville (Panguna) mine in Papua New Guinea

Allen L. Clark and Jennifer Cook Clark

1. Introduction

The closure of the Bougainville (Panguna) mine on Bougainville Island, Papua New Guinea (PNG), was a dramatic and sobering event for the mining industry and for many of the nations of the Asia-Pacific region, particularly those nations where mining is a major component of national development. The most significant events leading up to the closure of the mine have been well chronicled in the print media, and this information provides a useful database upon which to base an evaluation of the most important social, cultural and environmental issues that are believed to have led directly or indirectly to the ultimate closure of the mine.

A historical review of the activities associated with the discovery and exploration (table 1), development and mining (table 2), ultimate closure (table 3) and subsequent activities at the Bougainville mine (table 4) provides some useful insights in terms of understanding and evaluating what went wrong with the project. However, any such assessment must recognize that the events that led to the closure of the mine are more likely a complex interaction of factors within which the importance of any one issue is difficult to assess.

Table 1. Mine exploration

Date	Event
1960	Government geologist confirms the presence of copper mineralization near Panguna on Bougainville Island
1963	Conzinc Rio Tinto (CRA) granted Prospecting Authority
1966	Diamond drilling confirms presence of large low-grade copper deposit
1967	Mining Agreement negotiated between company and Administration with an offer of 20 per cent equity should the mine develop
1969	Bougainville Copper granted Special Mining Lease
1971	Bougainville Copper granted Tailings Lease over Jaba Valley

Although it is often said that hindsight is perfect, in the case of the closure of the Bougainville Mine it is doubtful that this is so because of the complexity of the issues that interacted to result in the ultimate closure. This is particularly true since the main issues are a complex interaction of political, social, cultural and environmental factors, which by definition are not separated by sharp boundaries and which represent values that are time and group/individual dependent.

It is also appropriate to say that these are issues which industry is by and large ill equipped to deal with even today and was even less qualified to deal with in the early to mid-1960s, when initial exploration and development took place, or the 1970s and 1980s, when the mining activity was at its greatest. That being said, it is important to note a significant dichotomy in the

Bougainville experience: although overall corporate concern for socially and culturally responsible development of the Bougainville mine would, by the standards of the day, have been considered exemplary by most impartial evaluators, the mine failed. As a result, the question of "what went wrong and why ?" arises.

Table 2. Mine development and production

Date	Event
1972	Mine starts production
1974	Renegotiation of Bougainville Copper Agreement - moratorium on future exploration
1975	Bougainville Provincial Government votes to secede from PNG
1978	Panguna Landowners Association (PLA) formed to increase compensation agreements
1979	Landowners riot in Panguna and loot supermarket
1981	Road blocked by villagers halts production. Scheduled review of 1974 Agreement does not take place, as national government does not want provincial representation

Table 3. Mine closure and beyond

Date	Event
1988	(a) Panguna Landowners Association presents new compensation demands (b) Discussion of environmental report breaks down. Francis Ona takes to the bush (b) Militant landowners begin campaign of sabotage
1989	(a) Curfew imposed (January) (b) "Bika Report" issued calling for full autonomy. Mine closes indefinitely (May) (c) Government talks lead to Memorandum of Understanding to be signed (September). Mine reopens briefly (d) John Bika murdered
1990	(a) Expatriate residents of Bougainville evacuated (January) (b) All-out war between PNG and BRA (January-February) (c) Blockade of Bougainville Island (April) (d) Endeavour Accord signed (August)
1991	Honiara Peace Accord (1991)

Table 4. 1992 and beyond

Date	Event
1992	15 BRA and 2 PNG Defence Force members killed at Arawa
1993	BRA kills 17 civilians and recaptures Arawa
1994	BRA calls for peace talks with Prime Minister Chan
1995	Theodore Miriung accepts Premiership of Bougainville Transitional Government
1996	Operation High Speed II becomes PNG's largest military disaster of the conflict PNG Defence Force withdraws from Bougainville essentially beaten. Theodore Miriung killed
1997	PNG commissions Jardine Fleming to approach RTZ-CRA with a buyout offer Introduction of "Executive Outcomes" mercenary force Chan Government in PNG falls as a result of Bougainville intervention

It is the purpose of this paper to identify, to the extent possible, the key political, corporate, government and industry, social and cultural, environmental and intergenerational issues that led to the uprising and to the final closure of the Bougainville mine. The following summary comments with respect to these issues are broken down on the basis of the issues which were not adequately understood, understood but not appropriately planned for or acted upon, or known but ignored for other reasons.

2. National sociocultural issues

It is often noted that Papua New Guinea is a new nation, having received independence only in 1975, in which over 700 individual languages and/or dialects are spoken, that there is no clear sense of "nation" within the disparate groups that make up the country and that there are long-standing animosities between various groups and areas that distinctly colour political decisions. With respect to the Bougainville mine, the most important of these issues are set out below and are briefly discussed as regards their impact on the mine. Among these issues are the unexpected pace of the independence process, the complex matters of national identity, the conflict between national and provincial government authority, of ownership of minerals, the failure to negotiate, and the failure to recognize the problems and respond appropriately.

The history of the Bougainville mine is characterized, to a greater or lesser extent at any given time, by continual disagreement between the national government and the provincial government, with the secession of Bougainville from the country as the ultimate threat. As a result, the development and operation of Bougainville were always overshadowed by an uneasy truce between the national and the provincial governments.

At the base of the uneasy truce were a number of key factors. The Bougainvilleans believed

that they were being exploited by the national government because the Northern Solomon Islands area was one of the poorest in the nation and it was not until the development of the Bougainville mine that the government took an interest in it. They firmly believed that they did not have an appropriate voice or appropriate recognition in government, and that the national government was not responsive to their needs in terms of their dealings either with it or with industry.

That all of these factors are important to a partial understanding of what led to the Bougainville closure is generally acknowledged. However, these factors provide only a broad foundation for understanding the political issues which drive the nation and which ultimately were key issues in the closure of the mine. Among other critical factors were industry issues, industry and government issues, social and cultural issues, and intergenerational issues.

3. Industry issues

Throughout the 25-year (1963-1988) life of the Bougainville mine (from exploration to closure) the mining companies involved (initially CRA and New Broken Hill Consolidated, later the operating company Bougainville Copper Limited (BCL)) had a mixture of success and failure in dealing with the social-cultural and environmental issues that arose as a result of the Bougainville mine. Overall, the record seems to show that the mining companies tried rather hard to be responsive to the concerns of the peoples of the Northern Solomons in general and to the Bougainvilleans specifically. The record shows equally clearly, and is dramatically punctuated by the closing of the Bougainville mine, that these efforts were not successful.

Several industry-related issues contributed to the closing of the Bougainville mine. A neocolonial attitude on the part of the mining company was exacerbated by the difficulty of the transition from administration to national government. The company placed excessive reliance on the national government and on "having met the requirements". It never really understood the social, cultural and environmental problems, and as a result it failed to act on key problem areas, in particular regarding the landowners of the mine site. The company failed to develop and follow up with an overall plan for education and social interaction, and to inform and educate the community regarding the economics of the mine. It failed to recognize the intergenerational problems and thus to deal with them effectively. Consequently, it also failed to deal with deteriorating community relations over the life of the mine. The lack of effective contingency plans led to a delayed and inadequate response to environmental issues and a failure to resolve the resettlement issue regarding those most affected. Finally, the company did not appreciate the historical basis for national government/provincial relationships, did not understand - and therefore did not address - the "key" economic issues, and did not understand the evolutionary dynamics of social issues.

4. Industry and government issues

Although there are a number of individual issues which are rather clearly ascribable to either industry or government, there are also a number of issues of importance which result from the interaction of industry and government. This would appear to have been particularly true with respect to the Bougainville mine because of the unique relationship between the governments of Australia and Papua New Guinea and the role that the industry played with respect to both of them.

Among the most significant of these factors were the lack of transparency in government/corporate discussions and the absence of any definition of the appropriate and needed roles of government and industry. The profit/excess profit issue was never effectively dealt with or discussed, and there was a failure to follow up on commitments, particularly concerning renegotiation. The national government and the company both lacked contingency plans and failed to follow up rapidly and effectively on issues; that is, they were reactive rather than proactive. Finally, the government and the company failed to act jointly.

5. Social and cultural issues

Of the diversity of social-cultural factors that interacted there are three which are of key importance. First, the social and cultural diversity of the indigenous Bougainvilleans, in terms of how the mining enterprise affected them, was never well recognized or dealt with throughout the life of the mine. Second, large-scale migration of workers to the island dramatically altered the social and cultural mix. Third, social and cultural issues evolved dramatically over time and, to a large extent, this resulted in the creation of an even larger and more diverse group of "disenfranchised" individuals. Important factors affecting the process, and which were not recognized in time, include:

- The social and cultural affinity of Bougainvilleans with the Solomon Islands;
- The "ethno-nationalism" of the Nasioi people;
- The sociocultural characteristics of the Guava, Dapera and Darenai areas;
- Social and cultural changes in traditional values and lifestyles;
- The importance of urbanization and migration; and
- The impact of the introduction of a cash economy.

6. Intergenerational issues

It is highly probable, however, that the major problems that ultimately beset the Bougainville mine project were largely intergenerational and derived from the structural changes in the society on Bougainville Island and their impact on subsequent generations. As an obvious example, there certainly, over time, grew to be totally different perceptions of the mine on the part of the elders of the area and the younger generation. Equally obvious were the problems associated with sharing in the benefits of the mine, in that as the population grew the benefits to the individual diminished, particularly with respect to compensation payments and cash benefits. The key issues in this intergenerational shift were the increasing population, the shifts in power and authority, and changes in the role of historical lineage and ownership. Increased education and expectations, together with the decline of the equity and "stakeholder" position, led to problems in facing the "real reality" of mining.

7. Summary and conclusions

The actions of the Government of Papua New Guinea in dealing with the Bougainville crises, in particular the armed intervention, the subsequent blockade and the most recent attempt to resolve the issue through the use of mercenaries, have adversely affected the situation even more

than when the mine was in operation. Although it is unlikely that the Bougainville crises will be resolved at any time in the near future, and therefore the final lessons are yet to be learned, the events so far provide some very useful insights. Among the most valuable lessons that can be learned are the following:

(i) Failure to deal effectively with social, cultural and environmental issues can result in the closure of even the largest mines;

(ii) The government-industry approach to mine development is no longer viable in most countries;

(iii) Despite the best efforts of the industry, if it does not possess the knowledge and the tools to deal with social, cultural and environmental issues it will fail;

(iv) Industry must be much more proactive than reactive in dealing with social, cultural and environmental issues;

(v) The most important aspect of dealing with social, cultural and environmental issues is to recognize that they are intergenerational and dynamic;

(vi) As mining proceeds the "reality of the mine" has an increasingly larger impact which must be dealt with;

(vii) Transparency is critical in all phases of the project; and

(viii) In crises the ultimate outcome of the need to maintain large mines will be armed intervention.

B. ANALYSING AND MITIGATING SOCIAL IMPACTS

Analysing social impacts: An overview
Kathleen Anderson

1. Introduction

Choices about whether, when and how to develop a nation's mineral endowment are complex. All paths to development have social, environmental and economic implications which must be evaluated and understood by decision makers, and communicated to those potentially affected. The challenge lies in making realistic, informed and wise decisions with information which is almost always incomplete, imperfect and shifting. While striving to develop policies which maximize the benefits of a mineral-based development path, decision makers must keep in mind that the fruits of such development can seldom be fully harvested without affecting the personal, social and civic lives of many people. The range, magnitude and timing of those effects depend greatly on factors such as the size and diversity of the affected community, the nature of the ore body, and the socio-political objectives of decision makers in managing and distributing benefits.

Properly managed, a mineral endowment can deliver a wide range of long- and short-term benefits. The most commonly cited one is the infusion of employment, economic opportunity and hope into rural areas plagued by poverty and chronic underdevelopment. Many countries have also benefited from foreign exchange earnings, the introduction of new technologies and practices, improved investment climates, construction of infrastructure, and the education and training of mine workers and their families.

A well-managed mine can generate innumerable spin-off benefits for the local community. Many sites offer meal programmes, food packages and other nutritional support to ensure that mine workers, their families and other local residents have the basic necessities for intellectual and physical growth. Schools, training centres and community-based education programmes can lay a foundation for stable communities, build local leadership, generate enterprises to support the primary mining activities, and diversify the economy in preparation for the ultimate shift to a post-mining economy. Improved health and education may make it possible to reverse the intractable downward cycle of poverty which plagues so many communities and turn it into a cycle which supports economic, social and communal well-being.

In some communities, institutions such as trust funds and community development boards have been created to reinvest a share of the mine profits for the purpose of building the human capital needed to ensure long-term economic and environmental sustainability. In other locations, citizens, businesses and governments have worked together to make decisions about how to develop, operate and close mines so that mining remains a temporary use of the land, and subsequent, sustainable land uses are protected.

A natural enthusiasm for such desirable outcomes, however, should not be allowed to blind decision makers to the potential, which may be at least as great, for generating social and environmental costs which might have to be borne for generations. Funds available for poverty alleviation are rapidly decreasing. Awareness is growing that human health and ecosystem health

are intimately intertwined. And, in most countries, the fiscal resources available for addressing problems are shrinking. Even though they are faced with many competing demands for scarce budgetary resources, governments are called upon to make informed decisions which will protect and enhance the nation's long-term economic, social and environmental well-being.

Experience has shown that should a country choose to proceed with mineral development, there are factors which will consistently affect the likelihood of achieving an acceptable level of benefits relative to costs over the long run. Among the most important are a well-designed regulatory regime staffed by trained professionals, and the political will to support good governance. However, even within such a sanguine climate, governments cannot achieve an acceptable range of benefits alone; they must find ways to cooperate - without losing autonomy and independence - with the mining industry, local communities and others. Informed by the science, engineering, economic and social considerations which are unique to every ore body, decision makers must also take into account values, perspectives and opinions which arise from religion, history, tradition and culture. Failure to do so may bring such costs over the long run that it would have been preferable from both the economic and the social perspective never to have embarked on the project in the first place.

Is it possible for governments, citizens and mining companies to make decisions and implement programmes and policies which will enhance the probability that the social benefits of mining are more fully realized, while also ensuring that the all too common environmental and social costs of mining are properly managed? In this paper I suggest that decision makers can indeed identify and select social and economic policies towards this end, and that when those policies are informed by the goals, values and perspectives of the host community, there is a greater likelihood that they will be long-lived, less costly to implement and ultimately more effective. To achieve this outcome will require a more explicit understanding of the dynamic evolution of the interrelationships between the characteristics of the ore body, and how it is developed, and those of the community. Most important, however, will be the commitment of corporations, governments and communities to be flexible and innovative in designing new partnerships founded upon mutual trust.

2. "Ready, fire, aim..."

The design and implementation of policies to address the social impacts of mining require a number of steps. First, the "problem" must be adequately defined. While this may seem obvious, it is this step which is most often neglected. Unfortunately "Ready, fire, aim..." is more than an aphorism; all too often, it accurately captures the tendency of decision makers (whether public or private) to begin implementing solutions before fully understanding the root of the "problem". What has been defined as the "problem" is often only a symptom. Policy interventions designed in this way may lead to a temporary alleviation, but seldom to long-term solutions or long-lived agreements. Unfortunately, the scarce resources of time, talent, money and goodwill, having been consistently misdirected and failing to deliver sufficient benefits to justify their investment, are often not available once the "problem" is correctly understood.

Set out below are a few questions which decision makers may want to ask themselves in order to gain an initial rough idea of whether the problem has been properly defined. The list is not intended to be comprehensive, but only a starting point.

- At what level, and where, are the decisions made about social and economic components of mining projects? There are many legitimate sources of power, control and authority in mining projects, a fact which arises largely from the capacity of mining to generate both benefits and costs of great magnitude (either in absolute or relative terms). Some of these are traditional and obvious, mutually agreed-upon even across cultural, regional, economic and political boundaries. Others are more transient and elusive, but no less legitimate. The trend towards removing barriers to foreign investment, coupled with the technical and engineering advances which allow development of projects in increasingly remote areas, makes it ever more important for decision makers to take the time to ascertain who makes what decisions, when, where and why.

- What has brought this issue to the attention of the decision maker? Is a mine permit pending, is there a threat of civil unrest, is new legislation being proposed, or is there an election coming up? Any of these events may precipitate the need to design, implement or update approaches to managing social issues in mining. Ascertaining quickly and clearly the motivation for a policy shift will assist decision makers in understanding the root cause of the problem.

- Is this problem an *un*intended consequence? Population control programmes, shifts in government employment strategies, structural readjustments, the advancement of education for girls or a tailings dam failure 4,000 miles away are only a few of the many variables which may necessitate an update or redefinition of policy approaches. Predicting and understanding the full implications of seemingly unrelated events in any rigorous, scientific sense may well be impossible. Flexibility, a willingness to be responsive and a commitment to updating community policies on a regular basis will help to ameliorate these challenges.

- Do empirical data exist to support a need for a new or updated policy? Quite often policy decisions are taken under conditions of inadequate or incomplete information. Sometimes this results from the intrinsically imprecise and evolving state of the art in the practice of hazard identification, risk assessment and risk management, particularly with respect to human health and social well-being. At other times this results from strong emotions induced by a portrayal of events in the local, national or international press. One cannot underestimate the importance of a timely, well-informed, and balanced presentation of facts by the media. The media can be partners in the timely evolution of relevant policies for mining communities. However, because of the scientifically complex and technical nature of much information in this industry, together with the historical tendency of mining companies to be recalcitrant and reluctant to deal openly with the media, ill-informed or inaccurate portrayals of events affecting mining communities are all too common. Decision makers often feel pressured to act prematurely in this context, and the outcome may be a loss of legitimacy, undermining of the integrity of the decision-making process and a disintegration of trust.

2. The locus of decision-making

There are interested and affected parties that not only have the power to affect quite profoundly how the policy problem is defined, but also can expedite or obfuscate the most effective

and well-planned implementation of solutions. Traditionally, companies have worked with central government authorities to identify and resolve their many social, economic and environmental challenges. Today, more progressive firms have expanded this formula and tried to find legitimate ways to include regional and local authorities directly in the decision-making processes. These forward-thinking firms, whether large or small, actively and aggressively seek to empower the communities they live and operate in. They have open, clear and comfortable communications with civic associations, non-governmental organizations, churches, trade associations, labour unions, various levels of government, international agencies, and many others. They willingly accept the social and civic responsibilities that come with being part of the community.

Not that this always stems from a sense of civic altruism. The economic benefits to the company are definite, measurable and indisputable. It can be clearly demonstrated that there are direct labour and training costs which result from accidents, illness and death, and that each of these undesirable outcomes is positively correlated with social decay, instability, alcoholism, lack of sufficient nutrition and lack of education. (It should be noted that these circumstances may have existed in the community long before the mine was built.)

There are sites around the world where sabotage, riots and extreme violence have put mine workers and mine infrastructure at risk, and the direct costs of managing and preventing these tragedies have escalated rapidly in recent years, affecting the economic feasibility of individual mines. Perhaps more important is the long-term loss of international goodwill, legitimacy and credibility for both companies and governments.

This is not to suggest that mineral development can, in isolation, lead to this level of conflict, but rather to argue that it is increasingly evident that companies and governments must work together to prevent and solve problems, with a commitment to inclusive decisions which engage the communities in which strife exists. It may be necessary to formulate policies which have historically been outside the limited ambit of social projects (education, infrastructure, philanthropy in the arts) with which mining companies are most familiar and comfortable. Again, the most important aspects of this issue are the correct definition of the problem, and the willingness to build partnerships in spheres which may be neither familiar nor comfortable.

Other indicators that the problem has not been correctly defined may be companies finding themselves renegotiating terms they thought were long settled or governments finding that they need to invoke police powers to enforce seemingly reasonable expectations as regards safe operating conditions.

These conditions can also arise from a failure to keep policies up to date. Even in those cases where time and effort were taken to aim carefully before implementing policies, circumstances may have changed in fundamental ways. As new technologies accelerate the rate of information exchange in even the most remote communities, the rate of social evolution is accelerating as well. Responding appropriately to dynamic and evolving social expectations is one of the biggest challenges facing decision makers. This is true if for no other reason than that the introduction of new enterprises and technologies inevitably changes the existing social order by exposing the community to novel ideas, experiences and opportunities, both material and cultural.

4. Goals, objectives and criteria

Many times decisions must be made and policies put in place without adequate or precise information. The cost of gathering information is high, and so it is important that what information there is addresses the concerns of a specific site, and provides correct input for the relevant policy objectives. Furthermore, there must be ongoing re-evaluations and updating of information about the characteristics of both the mine and the community. This is a dynamic relationship, changing and adapting in response to many influences.

The effect that a mine will have on surrounding human communities will vary dramatically over time. A mine may last only months, or it may last for centuries. The host community in which it is operating will evolve during that time. Some of this evolution will be attributable to the mine and all that it brings, but there are other forces of change which cannot be predicted, analysed or mitigated.

Protracted violent conflict, new technologies, the death of a leader or unintended consequences from seemingly unrelated legislation in a distant central city are only a few of the forces which may fundamentally alter a community, its values and, more important, how its members and the mine workers interact and relate to one another. Exploration, construction, development, operation and closure each typically will bring new personalities, demand for a different type of services and products, and a different type and level of effect on the physical environment. It is reasonable to expect that the community and the project will each be mutually transformed by the changes in the other. These relationships can and do shift in fundamental ways, and keeping up to date should be a top priority.

Responding appropriately to evolving social expectations is one of the biggest challenges facing decision makers. Setting goals, objectives and criteria explicitly is an acknowledgement that most, if not all, societies have limited resources with which to address the challenges that confront them. Problems such as rapidly growing urban populations, environmental degradation from many sources, poverty and political instability must "compete" for scarce, and in many cases declining, government and international aid resources. If policies are to be designed which meet the needs of the greatest number of people and which generate benefits which are "sustainable", analysts and decision makers need to ask, "What is important to us? What do we want to achieve? Why are we taking action to address this problem, as opposed to another serious problem? Is the support for this goal narrow and short-lived, or is there broad-based support with strong historical roots?"

There are many criteria from which decision makers may choose when considering how to proceed with and successfully manage the social impacts of mining. In some societies the protection of habitat for aquatic species is a primary criterion, weighted equally with the protection of human health. In others, it is the alleviation of rural poverty which guides the design and implementation of social policies with respect to mining. The traditional "Western" view calls for effectiveness, efficiency and equity to be the primary criteria for analysis of policies and programmes, but there are many others which may be equally or more appropriate.

The basic traditional criteria by which to measure success in social development are education, health and income. Distributional criteria may be important in some settings and are sometimes indistinguishable from such objectives as political feasibility and accountability. The international community may influence the adoption of other criteria, such as transparency,

participation, sustainability and environmental impact.

In establishing goals, decision makers are assigning priorities to a wide range of "values" which are informed by religion, history, culture, tradition, politics, education and many other factors. Many of these "core" values prevail throughout time, defining day-to-day activities and relationships in ways that are both conscious and habitual. Other values, sometimes referred to as opinions or perspectives, are dynamic and evolutionary.

That social and cultural values in host communities are at once variable and remarkably consistent, obvious and yet incomprehensible creates one of the biggest challenges. It is not my purpose to judge any set of values or opinions, but rather to argue that when the objectives for decision-making are explicit and well understood, and when the criteria by which they will be measured are thought out in advance, it becomes easier to rank problems and to define necessary trade-offs more clearly. Constructive and feasible solutions are more likely to evolve when they are based on premises acceptable and accessible to those charged with implementation, as well as to those who are affected.

Because they are subjective and value-laden, and because mining has the potential to create benefits and costs which vary widely for many segments of society, goals, objectives and criteria for decision-making about social development are unlikely to be universally agreed upon. However, it is my observation that diverse interests can come together for mutual benefit when interested parties are willing to be open about their objectives and when diversity of opinion, culture, training and experience are accepted in a climate of mutual respect.

5. A starting place

Just as each mine can be analysed, categorized and managed according to a unique combination of characteristics arising from site-specific geochemistry, topography, hydrology and geology, so too can host communities come to be understood by their unique fingerprints. While successful environmental management at the mine itself requires the full commitment and partnership of all mine employees, from the purchasing department through to the maintenance staff, successful socio-economic management requires the full commitment and partnership of the entire community as defined in its broadest sense. This broader community of partners, which I now define as all those affected by the development of a mineral resource, will be engaged in a dynamic and evolutionary relationship. In visits to over 150 mines in recent years, I have observed that although each of these relationships is unique, there are observable characteristics which in general tend to influence the evolution of socio-economic impacts.

The following is presented not as a rigid decision-making system, but rather as a guideline regarding how decision makers might begin to categorize "problems" and identify the appropriate level and type of criteria for the analysis of alternative management approaches. Considerations for inclusion in a category are (a) the scale of the proposed operation, (b) the distance from existing communities, (c) the expected life of the project and (d) income levels. Further refinements of this approach should involve environmental variables as well.

As discussed below, communities can move from one category to another as reserves are redefined with changes in price, technology, costs and regulation, and as population distribution,

infrastructure and other factors change.

5.1 Category A

In this group are newly discovered, smaller ore bodies, expected to be depleted relatively quickly, located in a remote location, far from existing communities. Regional poverty and unemployment rates are high, and workers are willing to relocate for any employment opportunity.

The communities which develop around the mine described above are among the most vulnerable to negative social impacts. Infrastructure which is not already in place is unlikely to be developed. The operator may be (but is not always) small and inexperienced, and basic health and safety precautions would not be expected. Rigorous inspection and enforcement are unlikely. The implications are in fact similar to many artisanal sites.

The social consequences, both beneficial and otherwise, of developing this type of mine are highly local, with three exceptions. First, the mine will attract workers who might otherwise have migrated to prime cities, many of which are already seriously overcrowded and are facing extreme social degradation. Second, even while small operators may not be able to afford state-of-the-art practices in mining, environment protection or social development, they do diversify the "pool" of suppliers of mineral products and are potentially a part, however minimal, of an equation for political stability in which the bargaining power of large, multinational mining companies is counterbalanced by domestic suppliers. Third, some of the world's great mineral finds started as small mines in this category, and further exploration and development led to an expanded definition of the ore body.

5.2 Category B

The initial exploration of this newly discovered type of ore body indicates that it is quite large, potentially a "world-class" mine. If it is located far from existing communities, or near small and underdeveloped ones, unmanaged social impacts could be quite severe. The trend towards removing barriers to foreign direct investment, coupled with technical and engineering advances which allow development of projects in increasingly remote areas, has led to a growth of projects in this category in recent years.

The economic opportunity created by a deposit such as this one will attract many willing operators, but the cost and the challenge of building a mine in a remote region will most likely limit the ultimate operators to companies which have access to international capital markets and extensive experience. It is probable, although not universally true, that state-of-the-art technologies, management and engineering will be employed. Experienced and progressive operators are typically at least aware that the well-being and stability of the communities they operate in are essential to their corporate well-being, although there is significant variability in the level and type of corporate/community partnerships which evolve.

Negative social impacts may arise from massive and rapid immigration of workers with high expectations. There being little or no capacity to meet the basic needs of this new population, social stresses may soon become evident. Even where experienced companies immediately act to provide

the basic necessities for incoming workers and their families, there may be high rates of random violence, alcoholism and sexually transmitted diseases, a lack of adequate housing, overcrowded roads, and other social impacts at the local and regional levels. (In North America, it has become quite common to mitigate the social impacts of mines in this category by adopting a "fly in, fly out" policy.)

Closure may be particularly problematic for a mining community in this setting. Even with the combined efforts of the private sector and relevant government agencies to diversify the economic base, it is likely that the regional economy will be heavily dependent on this single dominant source of income and employment.

It is important to note that mines in this category can and do generate abundant benefits for the host region and the nation. Revenues from various taxation schemes, increased availability of foreign exchange, the introduction of new technologies, higher performance standards, and the demonstration of engineered efficiencies are only a few of the many benefits which may accrue at the national level with the development of a mine in this category.

Benefits accrue to the broader society as new, significant streams of revenue become available to support the development of good governance. The purchase of state-of-the-art equipment and facilities becomes possible. Government professionals have resources for advanced training and education, and are exposed to a wider variety of regulatory approaches from which to choose. Efficiency in governance grows as government professionals travel, meet with their colleagues and learn from the experiences of others with similar challenges. More competitive salaries can be paid, and better educated, more talented workers may be attracted to the public sector.

An even wider range of social benefits can be assumed if mine-based revenues are directed to education. With more resources in the educational system (and less of the devastating level of poverty which necessitates child labour) the education of girls may become more probable, and this has been proved to be a critical support structure in the architecture of social development. Young women with a greater awareness of the existence of choices and options tend to delay childbirth and to take advantage of prenatal care, with the result that when children do arrive, they are healthier, more capable of learning and better able to take their place as productive members of society.

These benefits are not likely to accrue without close attention from and management by all parties. And most important, there must be a common long-term vision that will support investments in governance, education, and health which may not bear fruit immediately.

5.3. Category C

In this category, the ore body may be large or small, but it is located near an established community. The size and tradition of this community will determine the availability of a trained labour force, support services and economic diversification.

Many towns or regions which benefit the most from mining have (a) an existing and accepted mining tradition and several operating mines (optimally, ownership is diversified), and (b) an adequate or excess capacity to meet the needs of the mine and its workers. This may include

infrastructure such as hospitals, airports, deep-water ports and electric generating capacity; government professionals trained in regulatory responsibilities; recreational and religious facilities; vacant housing; a healthy, skilled labour force; and a socially stable community base.

By definition, this community is located in a mineralized region where there are other operators. The life of the mine becomes significantly less important in this milieu; other mines in the region may be able to absorb laid-off workers when an individual ore body is exhausted. It is in regions such as this that one can see the evidence of mining as the proverbial "engine of growth". It is common to observe mining communities in this context which begin to flourish as a result of the enhanced skills in the labour force, higher levels of education, a myriad of increased opportunities for workers and their families, better health and nutrition, and reduced infant and early childhood mortality and morbidity. Perhaps most important, and most difficult to quantify, is the overall hope and optimism which can come to a group of people when poverty begins to release its grip.

Good management and mine planning, reinvestment of mineral taxation proceeds into education, training and public services, and community involvement in the success of the industrial base create a three-way partnership which generates increasing benefits for partners in ways that are both tangible and intangible.

However, even in this sanguine environment, unexpected mine closures can and do occur, arising from price falls, reduced demand, increased costs or some combination thereof. When these factors affect the profitability of all the mines in the region simultaneously, the negative regional social impacts can be quite extreme.

There are similar communities, without a mining tradition, which have a diversified economy, generally good services, the capacity to absorb benefits, significant existing infrastructure, and a workforce willing to be trained to work in the mines. To fully achieve the social benefits of mining in this setting will be perhaps more of a challenge, but not an insurmountable one.

5.4. Category D

The ore body is found near a town or village, and there are no other operating mines. The distinguishing characteristic of this community is that there is an extremely high level of poverty within the region, as traditionally measured. What little economic activity there is derives from subsistence-based activities and barter; money is not the common measure of value or exchange. Disease and malnutrition may be far more prevalent than in the larger society and the average life span may be significantly lower.

The workforce is not likely to be educated, and there is little if any infrastructure and no long-standing relationship with government (central or otherwise). Indeed, communities such as this may often not acknowledge governing bodies or political institutions beyond their local authorities.

The capacity to absorb benefits in communities or regions such as this may be extremely limited and the changes which a mine introduces can be particularly harsh and extreme. If the ore body is large enough for mine life to be expected to be quite long, it is particularly important to explicitly define social objectives and criteria. The basic values, opinions, and perspectives of the

community are likely to be quite foreign to the mining company, the often to the government as well. There is little probability of effective citizen participation in the short run.

6. Conclusions

The site-specific characteristics which must be considered when evaluating a proposed or existing mine extend beyond its unique geology, hydrology or topography. Just as we have come to understand that there are clear and measurable indicators for whether an ore body can be developed and exploited in an economically and environmentally feasible manner, so it is possible to understand and evaluate the social aspects of mine development. The preceding comments represent preliminary thinking. As the issues grow in importance the contributions from participants which challenge, refute or affirm these hypotheses in conferences such as this one will become increasingly important.

Policy-making under all forms of government is an inherently muddled business, and unlike in the environmental field, there will never be chemical or biotic standards by which to mathematically measure success or failure in community well-being. Should a country choose to develop its mineral endowment as one of the many pathways available for economic development, social policies and regulatory regimes must be clearly analysed for relevance to each specific socio-geological site, there must be sufficient political will to manage the site at the appropriate level, and decision-making systems should be flexible enough to incorporate changing social values.

Data requirements for social-cultural impact assessment in mining

Jennifer Cook Clark

1. Introduction

Central to the process of undertaking social-cultural assessments and analysis is the ability to gather the required data. While, on the surface, this would appear to be an easy task, in reality the quality, quantity and scope of data collected will directly impact on the quality and usefulness of any social-cultural assessment and thus directly impact on the process by which all parties deal with social-cultural issues as they arise during the development of a mineral development project.

This discussion will address **who** may want to collect data, **why** certain kinds of data should be collected and **where** the appropriate data may be collected in order to carry out social-cultural assessments and analyses which are appropriate and useful.

2. Who acquires data?

Various entities may be interested in carrying out social-cultural assessments and analysis at different times in a mineral development process, including governments, communities (including individuals/representatives, local and regional communities), companies, non-governmental organizations (NGOs), financial organizations (lenders and insurers) and consultants. Each of these entities has a different perspective and reasons for carrying out a social-cultural assessment. Governments, for example, may be interested in the welfare of the affected communities in order to determine what benefits and services must be provided to affected communities. Communities, on the other hand, may be more interested in how the mineral development project may affect its members and in determining changes in their beliefs and feelings as a result of the project. For their part, companies may be interested not only in determining the issues mentioned above, but also in being able to track and monitor change in the affected communities against timely baseline data.

3. Why acquire data?

Among the most important reasons for acquiring social-cultural data are:

- To identify, define and assess the impact of the proposed mineral development project on local and regional communities;

- To plan for mitigation of the impacts;

- To negotiate with other parties to implement measures to deal with impacts, including for example dealing with adverse affects or provision of beneficial services.

An important point to recognize is that each party collects data to further its own interest and usually data and information are collected to bolster specific views and positions. Ultimately, however, all parties must have a common understanding of a core amount of social-cultural information for a project to be successful. This is achieved by consciously attempting, from the

outset, to collect data as objectively as possible, so as to reduce the amount of bias in data collection, and by objective data analysis. Perhaps most important in ensuring that the parties reach a common understanding of the most important data is **data and analysis sharing**. Only through sharing data and information can different views and beliefs be analysed, shared and utilized to design, develop and maintain a successful mineral development project.

4. Data sources

Data sources for social-cultural assessments and analyses are diverse and will vary on a case-by-case basis. A brief list of data sources would include:

- Existing sources
  - Historical records
  - University research
  - Government records
  - Internet

- Field research
  - Anthropologists
  - Social geographers
  - Subject specialists, such as doctors, economists and linguists

- Community sources

With regard to the last category, there is a distinct hierarchy which consists of individuals, group representatives, local government, provincial government and national government.

Other community sources of data and information, which are often overlooked, include:

- Special groups
  - Village leaders
  - Poor/landless
  - Government agency officials (local, regional and national)
  - Small miners

- Random groups
  - Encounter groups
  - Coffee-shop groups

- Groups stratified on the basis of:
  - Age
  - Landholding/wealth
  - Occupation
  - Gender
  - Whole household
  - Ethnic origin

Kin
Exchange labour
Immigrants

5. Data collection approaches

Data collection for social-cultural assessment and analysis should begin at the very beginning of the mineral development project, preferably before serious exploration starts, if possible. The kind of data collection will obviously vary with each project and the stage of the project, but a valuable tool that can be used at the very beginning and then periodically is that of making rapid reconnaissance reports at regular intervals. Initially, however, this is normally the predecessor of a more detailed and specific Social-Cultural Impact Assessment (SCIA), which entails more detailed data collection and analysis, including analysis of the impact of the proposed mineral development project on the affected communities. In the analysis of that impact, numerous specialized reports will also be necessary.

6. Data collection formats: Rapid reconnaissance reports

The purpose of a rapid reconnaissance report is to provide a description of life in an area which has been proposed for a mineral development project, so as to develop basic information on the feasibility of beginning a project in that area. A rapid reconnaissance report is especially important when the project is to be undertaken in a region where little is known, because it will provide important initial guidance to policy makers and decision makers. A rapid reconnaissance report also provides basic information for the design and execution of more formal studies, such as the Social-Cultural Impact Assessment (SCIA). Finally, it also provides a basis for training field personnel (exploration geologists, etc.) In appropriate procedures for contact with the affected community. In preparation for a rapid reconnaissance report, the critical question to ask is "when is a rapid reconnaissance report appropriate?" It should be undertaken before any significant contact with the people of the community to be affected, usually before significant land-based exploration, and it should be re-evaluated at each significant stage of the project and/or at any problem points during the development of the project.

The benefits to be derived from a rapid reconnaissance report are numerous, including:

- Minimum cost;

- Initial understanding of the local community, ecology, and how people perceive their conditions and make decisions;

- Introduction of parties to the community on the community's home ground;

- Incorporation of different subject matters and different points of view;

- Heavy reliance on indigenous knowledge; and

- Identification of immediate and obvious problems.

A rapid reconnaissance report is akin to a traveller's rapid view of a region from a local mountain top, which provides a quick look at the terrain and a general outline of it and of challenges. This is in direct contrast to a view from ground level, which tends to focus on the details of the issues immediately present and where a broader perspective is often difficult or impossible to take. A keen and sensitive look at the scope of the project (the "terrain") will aid in later success.

Along with the significant benefits, there are also substantial limitations to rapid reconnaissance reports that need to be recognized and accounted for in any analysis. These include the following:

- Reliability and validity of information may be reduced because of the rapidity of the survey:

  Usually no probability sampling is undertaken, and therefore it is possible to obtain information which is not representative of the community as a whole - for instance, more accessible areas may be surveyed rather than less accessible ones;

- Individual biases of surveyors may enter into the data or analysis:

  For example, people hear what they want to hear and do not hear what they do not want to hear; or groups may consciously or unconsciously respond to feedback from the surveyor;

- Because fewer individuals undertake the survey, there may be less technical expertise in some areas;

- Qualitative data are difficult to record and analyse;

- Fewer quantitative data are collected and analyzed.

However, these limitations/problems may be minimized if they are recognized and understood. Some techniques to achieve this are:

- Use of additional measures to increase reliability;

- Use of a balanced multidisciplinary team if possible;

- Provision for "external validity";

- Use of measures to minimize bias which have been developed in ethnographic studies for collection and analysis of data; and

- Use of data and analysis in appropriate ways (a critical requirement).

The process of undertaking a rapid reconnaissance survey will require methodological flexibility as regards where and how field data are collected, a multidisciplinary approach and the ability to accommodate new material and information quickly. Initially, disparate data will be collected, resulting in mid-way focusing of the survey as to both successful methodologies of data collection and types of data to be collected, resulting in turn in initial conclusions and analysis.

The steps which are needed for undertaking a rapid reconnaissance survey include:

- Defining the parameters:
  - Region
  - Time
  - Available resources
  - Project's aim
  - Existing information
  - Ecological and anthropological consistency

- Single survey versus multiple surveys

- Pre-fieldwork preparation:
  - Assemble and review relevant socio-economic data from existing data sources, as well as aerial photos and land use, relief or ecological maps;

  - Studies of the area conducted by other disciplines (for example, forestry, water resources, community health, social anthropology) should be collected;

- Fieldwork:
  - Ground-truth of existing information
  - Gathering new information

When new information is gathered, primarily by fieldwork, a few important initial framework decisions must be made. These include:

- Analysis:
  - What kind of information is needed?
  - For what purpose? Define objectives clearly

- Tentative topics should be defined: social, cultural, religious, economic, transportation, agricultural, ecological, resource utilization;

- Tentative groups and individuals to interview should be defined.

Furthermore, the following four basic tenets of fieldwork in undertaking social-cultural rapid reconnaissance surveys, social assessment impact analysis or any other kind of "on the ground" work apply: observation, conversation, recording, validation.

After the data have been gathered from the pre-fieldwork and fieldwork, summary reports are prepared according to the following guidelines:

- They should be prepared immediately after the fieldwork;

- They should be written in language understandable by everyone;

- Recommendations should be brief;

- There should be suggestions for further work; and

- Copies of all reports should be provided to all interested individuals, offices and institutes.

7. Data collection formats: Social-Cultural Impact Assessments (SCIAs)

After the initial rapid reconnaissance surveys and reports have been undertaken and analysed, they can be used to further delineate the more formal and detailed work required in a Social-Cultural Impact Assessment (SCIA). The following details some of the most basic information concerning SCIAs:

Purpose: Detailed impact assessment of the effects and relationships that a proposed mineral resources development project will entail for any relevant community (local/regional).

Who: Usually a company, but it may be a government or non-governmental organization.

Why: Companies, communities and governments are learning that the adverse impacts of mining projects can be minimized, mitigated and sometimes avoided if they are studied in advance and in detail. Furthermore, positive social and health benefits and planned positive development are possible, given proper planning and community consultation and cooperation (examples include the Misima mine and the Porgera mine in Papua New Guinea, and the Red Dog Mine in Alaska).

SCIAs are important because they allow all interested parties to participate in the decision-making process concerning the mineral development project and, in so doing, make it possible to minimize or avoid critical social-cultural risks to a project which can result - and have resulted - in delayed or closed projects. Each party in a mineral development project will ultimately benefit from social-cultural impact assessment.

Governments benefit because the SCIA allows them to **mandate, monitor** and **enforce** the same kind of intensive review of consequences for a region's "human capital" as is now required in many countries with regard to a project's consequences for the environment through Environmental Impact Assessments (EIAs or EISs). In addition, the SCIA allows for the rational and consistent **assessment** of a project's possible effects on and benefits for a region, so as to enable government decision makers to adequately assess the risks, liabilities and benefits to the country and the affected region(s).

Community and non-governmental organizations benefit since the SCIA permits a **transparent process** for public decision-making concerning social and cultural issues (a highly qualitative endeavour) in a rational, predictable and controlled public decision process. It allows for the **substantive input** of all interested parties to decision-making concerning a mineral resources development project, and it enables a community to make **informed decisions** with regard to possible trade-offs between adverse impacts and benefits from a mineral development project.

For companies, the SCIA allows the rational and consistent **assessment** of a project's possible effects on and benefits for a region so as to enable corporate decision makers to adequately assess the feasibility of the project and assess its risks, liabilities and benefits. It provides the basis upon which the Social-Cultural Plan will be formulated and will define the scope of the company's involvement and responsibility; and together with the Social-Cultural Plan, it will be the basis for establishing a Social-Cultural Fund which will provide financial surety during and after the mining operation.

While the benefits of undertaking SCIAs are great for all parties concerned, there are a few drawbacks which must be understood and integrated into the SCIA planning process. Some of these are similar to those of rapid reconnaissance assessments, except to a lesser degree because of increased size and scope. They include the qualitative nature of the data (for example, people's attitudes are difficult to express and analyse), the lack of clear guidelines to assess social and cultural costs and benefits, and the insufficiency of baseline data. On balance, however, the benefits of SCIAs will benefit all parties to the mineral development project.

The processes and methodologies of a SCIA will vary from project to project, and data collection will generally follow the broad outlines set out above for the rapid reconnaissance survey and report, except that it generally is more broadly based, is conducted under more formal auspices, and is both more multidisciplinary and detailed. Data collected in the SCIA phase will become part of the database on the basis of which all parties will ultimately make their most fundamental decisions regarding the mineral development process; they will be the framework for more detailed and periodic follow-on work; and they will be the basis for the formulation of the Social-Cultural Plan, which will generally guide the development of the project with regard to social-cultural issues and aspects.

Mitigating social impacts: The case of Namaqualand, South Africa

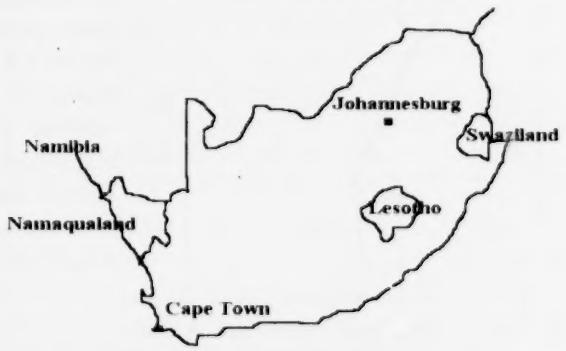
Olle Östensson, UNCTAD

1. Background

The United Nations Conference on Trade and Development (UNCTAD) has recently initiated a project on regional planning for sustainable development. The project utilizes an integrated participatory approach to sustainable development and includes training in the use of tools for planning, risk assessment and decision-making. The approach will be used in several countries with a view to formulating and applying a multidisciplinary framework which will facilitate planning decisions in the context of exploitation of natural resources. Initially, the project focuses on mineral resources.

In the context of the overall project, UNCTAD is at present cooperating with the Government of the Northern Cape Province in South Africa in exploring development alternatives for the Namaqualand region. Namaqualand is located in the north-western corner of South Africa, bordered by Namibia in the north and the Atlantic Ocean in the west (see figure 1). It has an area of 47,700 square kilometres and a population of about 60,000 people.

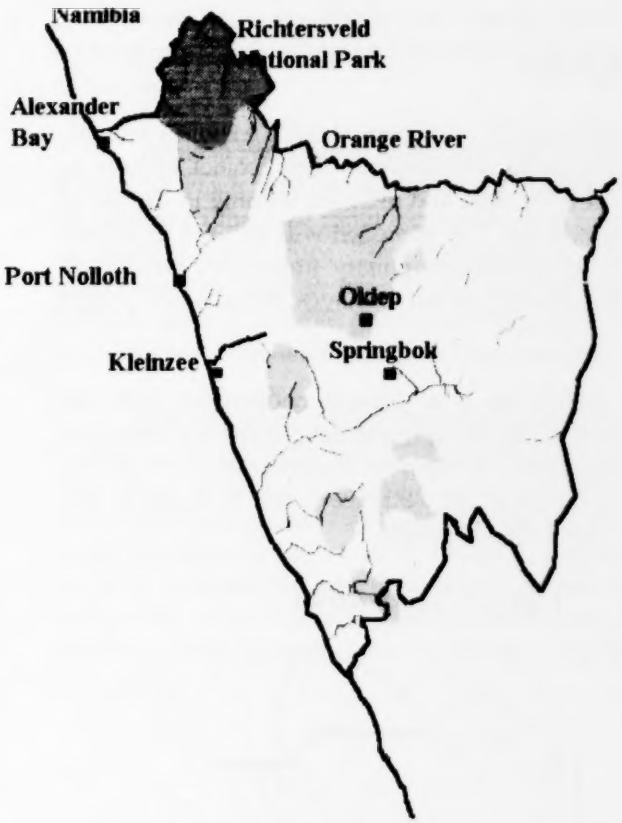
Figure 1. South Africa



The region is semi-desert and has limited potential for agriculture, except for irrigation-based crops on the land along the Orange River, the region's only real river. Goat and sheep herding has traditionally been the basis of the local economy, and a large portion of the population still depends at least partly on this activity. However, the number of animals considerably exceeds the sustainable carrying capacity of the very arid land. Most of the region has less than 100 millimetres of rain per year, and only very small parts have as much as 300 milimetres. The areas where herding is the main activity correspond to the "Rural Coloured Areas", where grazing land is managed on a communal basis (the grey areas in figure 2). Under apartheid, the coloured inhabitants, who are of mixed Dutch and Nama ancestry, were not allowed to own land outside these areas. The Rural Coloured Areas generally consist of a centrally located village surrounded by semi-desert grazing land. The entire population lives in the central village, with a large portion commuting to work outside the area. The coloured population makes up over 80 per cent of the population of the region, with whites accounting for most of the rest. Outside these areas, most of the population is concentrated in the administrative and commercial centre of Springbok, in a smaller commercial centre at Port Nolloth and in the

mining communities.

Figure 2. Namaqualand



The main economic activity of the region is mining, with two large diamond mines and one copper mine accounting for most formal employment. There is also some tourism, limited however to a short period each year when the desert flowers are in bloom. The main area of tourism interest is the Richtersveld National Park in the north of the region (the dark grey area in figure 2). Infrastructure for more extended tourism is largely lacking. Manufacturing is negligible.

Table 1 shows the distribution of Gross Geographical Product (GGP) and formal employment, by economic activity, in Namaqualand and the Northern Cape Province. During the period from 1980 to 1991, GGP in the Northern Cape Province grew at an average annual rate of 0.3 per cent at constant 1990 prices, while that of Namaqualand decreased at an average annual rate of 3.4 per cent, mainly because of output reductions in the mining industry. The number of formally employed persons in Namaqualand decreased from 22,248 to 16,634 during this period, while the total economically active population remained roughly constant at about 25,000.

The two major diamond mines are Alexkor (owned by the State), which is located at Alexander Bay at the mouth of the Orange River, and Kleinzee (owned by De Beers). Both of the mining companies mine alluvial deposits in a narrow coastal band, with some offshore mining being carried out by boats and divers near the coast in relatively shallow waters. Alexkor mines the stretch from Alexander Bay to Port Nolloth, while De Beers' activities extend from Port Nolloth to just south of Kleinzee. There is also smaller-scale alluvial mining in several sites near Kleinzee and along the lower parts of the Orange River. The two major mines have an expected remaining life of about ten years, after which the deposits will be exhausted.

The copper mine, at Okiep, currently has reserves corresponding to about four years of mining.

As the mines are currently the major employers in the territory, the economic effect of downscaling on the local communities is potentially devastating, and it is clear that, taking into account multiplier effects on employment, the closure of the mines could deprive most of the population of Namaqualand of their livelihood.

Table 1. Gross Geographical Product and formal employment, by economic activity (percentages), Namaqualand and Northern Cape Province, 1980 and 1991

Sector	Namaqualand		Northern Cape Province	
	1980	1991	1980	1991
Agriculture, forestry, fishing				
GGP	2.4	4.2	10.3	11.4
Employment	7.7	10.2	19.7	22.3
Mining, quarrying				
GGP	78.4	62.1	36.1	27.9
Employment	43.3	44.0	17.1	12.4
Manufacturing				
GGP	0.9	1.3	4.9	4.3
Employment	2.8	2.0	4.7	5.1
Electricity, water				
GGP	0.1	0.2	2.7	3.5
Employment	0.9	0.3	1.5	1.3
Construction				
GGP	1.5	1.0	2.8	2.1
Employment	12.7	5.8	7.5	5.7
Commercial services				
GGP	11.9	18.7	31.1	31.9
Employment	13.8	14.3	21.8	19.1
Community services				
GGP	4.8	12.5	12.1	18.9
Employment	18.9	23.4	27.8	34.0

Sources: Development Bank of South Africa; Central Statistical Service.

The inevitable retrenchment of employees from the mines is as much an environmental issue as an economic one: experience from previous retrenchment programmes has shown that a forced return to a subsistence existence primarily based on herding of goats and sheep, which as things stand at present would be the only possible option for most of the mine employees, results in immense pressure on the environment as herd sizes are increased. Lack of water and fertile land, and the constraints posed with regard to alternative land use options by the present land tenure system, severely limit the scope for development of alternative economic activities[10]. Mass retrenchments from the mines could thus result in increased desertification of an already stressed environment and adversely affect the region's agricultural potential, as well as its tourist industry.

[10] Most of the land in Namaqualand will not be affected by the land restitution programme in South Africa, since this programme aims to return land that was appropriated after 1901, most of the land in Namaqualand having been taken from the original inhabitants well before that date.

Economic plight will also inevitably lead to the forced migration of people from currently stable communities that have existed in their villages since well before British colonization in 1847, and have developed a distinct and unique Nama aboriginal culture and society. The closure of the mines thus materially threatens the economy, the environment and the social and cultural fabric of the region.

Timely, strategic planning is therefore critical in order to manage the economic, environmental and social consequences of the closure of the mines. At present, economic planning by the authorities and various levels of government is constrained by the resources available to them, and these are under severe strain. Ultimately, decisions regarding future development, including the use of the region's natural resources, will have to be made by those whom it affects most - the people of the territory. However, for the people to make informed decisions about their future, they have to be in a position to examine options and resolve the conflicts that may arise regarding those.

At present, the people of the region are not well informed about the viability of the various ideas for alternative economic development that have been put forward. These ideas, some of which have been the subject of some evaluation and small-scale trials, include small-scale mining of diamonds and non-metallic minerals such as construction materials and semi-precious stones, irrigation-based agriculture mainly along the Orange River, aquaculture of oysters and mussels, and eco-tourism.

2. The UNCTAD project

The project on which UNCTAD is cooperating with the provincial government is designed to provide the local communities in Namaqualand, as well as other stakeholders, with the tools that will help them to build knowledge and to formulate and evaluate options for land and natural resource use, so that the consequences of decisions can be anticipated and examined. In order to provide for a balanced approach, decisions have to be based on a framework that takes into consideration alternative uses of land and other resources, and assesses their merits on the basis of common criteria such as employment, wealth creation and conservation. This implies a process of consultation and cooperation involving all who have an interest in the issues in question, particularly those who have a direct vested interest, such as the project investors and developers, the employees and the communities directly affected by the project. However, for all stakeholders, particularly the local communities, to participate on a level where they can develop informed opinions and make qualified decisions, appropriate tools and training are needed. Such tools and training should enable the communities, as well as other interested parties, to examine the various development scenarios, and compare outcomes in terms meaningful to them.

The project will be developed with the active participation of the communities through their development forums, and also with other concerned parties such as industry and non-governmental organizations in the region. It will form one of the elements of the economic development strategy currently in preparation for the province as a whole.

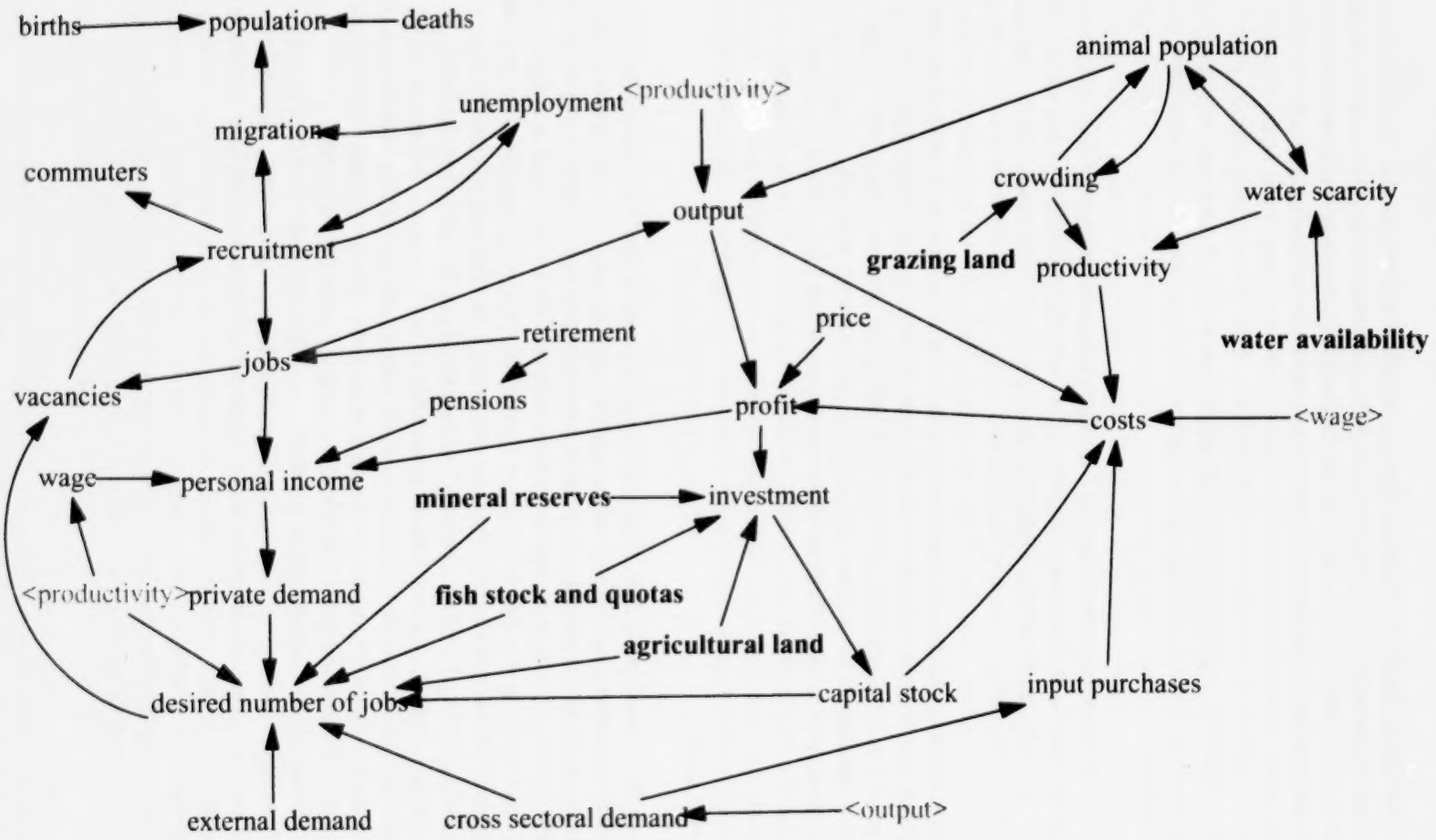
Providing the communities with the relevant tools can be achieved by developing structural models that represent the linkages between socio-economic activities and various forms of land use. These models incorporate demographic, economic, social, environmental, cultural, political and

legal variables, functions and relationships, linked in such a way that developments in one sector will be reflected in effects on other sectors. While the underlying techniques and algorithms are of necessity complex, it is intended that the methodology as a whole will be used by non-specialist, trained laypersons. The methodology must therefore be interactive, easy to use and accessible to people in the communities themselves. It needs to be developed using established theory as well as local knowledge, i.e. with the active participation of the affected communities, industries and other interested parties, rather than by specialists in isolation from these parties. Moreover, it needs to draw on available information, with primary data being collected where there is a lack of key information.

The structural models describe the linkages between production facilities (mines, farms) and the environment and economic structures at the local, regional and national levels. The models are based on techniques such as input/output analysis, dynamic simulation, financial simulation (including the flows of income between and within the sources of production, the State and the broader community) and feasibility modelling. They will be successively refined through an iterative process whereby the interested parties in Namaqualand are consulted and asked to provide their views on both the accuracy of the data and the realism of the functional relationships depicted by the models, thus helping in the task of validating the models. The models are integrated into an overall simulation framework provided by the software platform, a commercially available decision-support system which simulates model scenarios. Risk assessment techniques are used to analyse the results of the simulations, providing a tangible way of studying policy scenarios and assisting the user in evaluating the effectiveness of development policies. Figure 3 shows a graphical representation of the main structural relationships in the basic structural model of Namaqualand.

The Namaqualand economy is driven by export-oriented sectors, principally mining, although agriculture and fishing make significant and potentially important contributions. Output in these sectors does not face any demand constraint over the medium term, but is constrained by the availability of natural resources: mineral reserves, agricultural land, and fish stock and quotas (in bold in the figure). Subject to these constraints, output is determined by profitability, which determines capital investment. The subsistence stock farming sector exports only a small amount of its output, most of it being consumed locally, mainly by the owners of the herds. This sector also faces supply constraints in the form of availability of grazing land and water (in bold). It should be noted that, both for reasons of climate and soil quality and for institutional reasons related to land ownership, there is little scope for changes in land use over the medium term. Thus, crowding in the stock farming sector as a result of a growing population of goats and sheep would affect productivity in other sectors only marginally. For water, however, real conflicts can and do occur, with increased water use in one sector affecting productivity in others. Demand for the output of other sectors is determined by the input purchases of the export-oriented sectors and by private demand, an important element of which, of course, derives from wage income in the export-oriented sectors.

Figure 3. The main structural relationships in the Namaqualand model



The data contained in the structural models and the results generated by the functional relationships are linked to a geomanagement system. This system provides an "electronic map", or geographically referenced data management system of the area, which contains the location of natural resources, communities and infrastructure. Information relating to these features, generated by the structural models just described, are stored and linked to specific locations. The tool allows for a multidisciplinary approach, with the technical possibilities of multiple views or "windows" and simultaneous communication between different sources of information. This provides for easy-to-understand demonstration and illustration of results, since the various stakeholders can explore alternative scenarios for the future and "see" how these affect the economy, the environment and ultimately themselves as the people of the region. Again, a commercially available software is used for the geomanagement system.

The softwares used, which are PC-based, are characterized by their transparency as well as by their capability to integrate information in different domains. These features are essential in order to promote dialogue and they also help to demystify the decision-making process.

Apart from development of the models, training and capacity-building are fundamental components of the project. Capacity-building is achieved through the effective use of the tools not only by the communities themselves but also by public and private sector officials and other interested groups. A major objective is to facilitate a cooperative approach to development through the use of a common model at different levels of planning. A further objective is to empower communities and other parties to become closely involved in an integrated decision-making process. Both these objectives relate to the need to strengthen the capacity of the province and region to plan economic development in the long term.

The capacity-building component of the project is carried out by means of training programmes designed to train trainers. A selected group from collaborating agencies and organizations will participate in the training. These trainers will develop the capacity of the organizations and groups which they represent to formulate and monitor the implementation of development policies.

The training will consist of two parts. The first part will focus on the conceptual framework of the project and will provide a basis for understanding concepts such as sustainable development and how modelling techniques can assist in policy formulation. In the second part, the participants will be introduced to the tools, that is the geomanagement and simulation software. The training will be based on practical examples, giving participants an opportunity to acquire hands-on experience in exploring different development policies. Policy evaluation and the implications for long-term management of natural resources will be an important component of the training.

3. Earlier applications

The approach outlined has already been applied to assess the consequences of scenarios and to guide policy-making in Senegal, Greece and Honduras.

In Senegal (where the project was undertaken by the Ecotechnology Research Centre at the Cranfield Institute of Technology, United Kingdom, funded by the European Community DG-VIII),

the model used represented the changes taking place in the interlinkages between population, commercial and subsistence activities and environmental conditions such as type and quality of soils and water availability.

A case study in Greece - in Crete (where the model was developed by the Foundation for Sustainable Development, Netherlands, as one of the partners in the MEDALUS project, funded by the European Community DG-XII) - aimed to assist in dealing with problems of desertification in the Mediterranean basin. A geomanagement system was used as a decision tool to explore scenarios related to the expansion of tourism to the year 2000. The dynamic simulation model represented the forces driving land use changes and the effect of policies intended to mitigate land degradation and loss of biological diversity.

In Honduras, on the island of Roatan (where the project was undertaken by the United Nations Institute for Training and Research, funded by the United Nations Environment Programme), the geomanagement system was used as a participatory tool for exchanging information concerning development planning in coastal zones. Local NGOs, central and local government agencies and tourism agencies worked together in the exploration of alternative development policies for economic sectors such as tourism and fisheries and analysed a number of proposed development projects, including for development of water resources. The project included a strong capacity-building component.

4. Further applications of the framework

It is hoped that the employment of a participatory framework in Namaqualand will help to promote its use in other developing countries faced with the problem of ensuring that mineral projects are developed, implemented and brought to a conclusion in a manner that is consistent with the interests and aspirations of all the parties concerned. In many cases where interests are seen as being diametrically opposed, the adoption of a common frame of reference and the joint exploration of options may result in the identification of not just mutually acceptable, but also mutually advantageous, solutions.

The UNCTAD secretariat is currently looking for other sites and situations where the framework could be usefully applied. The aim is to include five different countries in order to provide a variety of experience for pilot applications. The situations should present well-defined problems with a clearly defined geographical scope. They should all be difficult to solve through the use of existing mechanisms. The project will rely on cooperative institutions in the countries concerned for on-site support; this will include, most importantly, selection of an appropriate situation, liaison with national, regional and local authorities and other interested parties, and logistical support.

C. DESIGNING AND IMPLEMENTING SOLUTIONS

Legislative and policy solutions for social and cultural impacts of mining

Jennifer Cook Clark

1. Introduction

There is a growing awareness by the mining industry, government regulators who oversee mineral development projects, and communities that there is an urgent need for an effective method to deal with social-cultural issues associated with mining. This awareness is largely a result of growing pressure from communities that are unhappy with social and cultural impacts of mining projects and with the benefits they receive, including revenues, and of corporate understanding that production is potentially greatly affected by social-cultural issues. Increased understanding by governments that as equity partners their potential liability increases if social-cultural issues impact on mining projects contributes to enhancing this awareness, as do the more active global role assumed by non-governmental organizations and the evolution of international standards of corporate conduct.

Currently, however, no country has an adequate legal regime for dealing with social-cultural issues as they relate to mineral resource development projects. Some developed countries, such as Australia, Canada and the United States, have experience with social-cultural issues and their legal regimes are currently evolving and developing to deal with them. However, few developing countries, especially in Asia and the Pacific, have any legal regimes to cover social-cultural issues.

2. Present status

Largely as a result of the problems it has encountered with mining projects being adversely affected by community social-cultural concerns, the mining industry has generally taken the lead in establishing methods of dealing with social-cultural issues. Some companies have tried very hard to deal with problems effectively and sensitively, whereas many others have a dismal record. Governments, on the other hand, have largely been the followers and have been reactive as regards problems which have arisen in many past and present mineral resource development projects.

It is fairly well recognized that, even at their best, methods of dealing with social and cultural issues are evolving quickly and almost all (with a few limited exceptions) have failed to meet the affected communities' and international expectations of acceptable solutions to the sometimes irreversible problems.

Also leading to quickly evolving reactions to mineral development projects and the approaches of companies to social cultural issues are the fact that some communities (for instance, in Papua New Guinea) may be sharing information on companies and opposition strategies, and the fact that non-governmental organizations have become more vocal, more vociferous and more powerful in their protection of affected communities and better able to affect solutions to problems.

3. Solutions

It is clear that governments must take a more proactive role in developing and enforcing legislation and codes of conduct concerning social-cultural issues in mineral resource development projects. A certain amount of regulation will ultimately be inevitable to some degree, and corporate conduct today will largely determine the amount of regulation that it will face in the future. The question that looms then is how a regulatory or legislative solution can be structured to provide the necessary support and protection of communities while not being excessively burdensome to companies undertaking mineral resource development projects.

There are currently some guidelines which can usefully be consulted in developing a regulatory scheme for social-cultural issues:

- International agreements;

- International standards of conduct;

- International environmental standards (for example, those drawn up by the International Organization for Standardization (ISO));

- Other countries' policies and legislation concerning social-cultural issues (which may not always be easily adaptable); and

- Past mining company experience.

4. Structure of a regulatory solution

The following are the minimum components necessary for a legislative and/or regulatory system:

- Clear government policies concerning mineral development and social-cultural issues, including clear protection of the rights of indigenous peoples and communities;

- Laws and implementing rules and regulations, including:
  Mining Law (with mineral title and land tenure regulations);
  Investment Law (which defines tax treatment for expenditures);
  Legislation concerning indigenous peoples;
  Environmental Law (with regulations for Environmental Impact Statements);
  Social-cultural laws and regulations (including on Social-Cultural Impact Assessment (SCIA));
  Legislation on land use, health and safety, and labour;
  Forestry Law

- Government capacity (institutional and technical) to monitor and enforce project-specific contracts between the government and the company, where appropriate, as well as project-specific contracts between the industry and local groups or landowners.

5. Social-cultural impact assessments and procedures

Social-Cultural Impact Assessments (SCIAs) should be a focal point for ensuring that companies adequately assess and plan for impacts on communities which are affected or may be affected by companies' proposed mineral resource development projects. Because a proper assessment necessarily includes community consultation and analysis, any legislation which mandates SCIAs should prescribe a **process** that a company should undertake in order to adequately consult with the community and ensure that the latter's valid concerns are incorporated into the overall development plan of the mineral resource project and also incorporated into a specific social-cultural development plan. The administrative process which is required to oversee the SCIA process, which will require community participation and comment as appropriate, may be contained in implementing rules and regulations.

The critical elements of the SCIA process include:

- Designation of responsible government agency(ies);

- Timing of SCIA Draft and Final Submissions;

- Minimum substantive elements, including baseline studies, a social-cultural plan and a social-cultural fund;

- Public comment (who may comment and when);

- Definition of how public comment must be dealt with by the company;

- Substantive government participation;

- Resubmission of the SCIA after consideration of comments;

- Timing of governmental consideration and approval or rejection; and

- Dispute resolution and appeals.

6. Required government capacity for the SCIA process

In order to have an effective SCIA process, the government must have oversight and enforcement capacity. Critical elements of this capacity include enabling legislation for agency authority, creation or designation of the appropriate administrative branch of government, monitoring of the process and participation in it, monitoring of compliance (including agency participation), enforcement and dispute resolution.

Preventing problems: A partnership approach

C. George Miller

1. Introduction

The purpose of this paper is to assist in preventing problems that can arise in the process of mineral development. Its basic assumption is that conflicts can be avoided when mining developments take place within a sound and stable legislative framework, in harmony with the environment, and with due respect for the wishes and needs of the wider community.

Building alliances and partnerships between the State, the mining company and the community can help to avoid difficulties in mineral development. These accommodations are not easy to achieve, however. Indeed, there are many people who feel that conflict is inevitable, and that managing it is the best that can be achieved. But trying to avoid conflict is to everyone's advantage in the long run.

Three topics will be covered in this paper. "Building new industry-government-community partnerships" (section 2) will identify some principles of partnership and suggest areas in which partnerships may be formed. "Public participation in decision-making" (section 3) will explore the purpose of public participation in decision-making, the levels or degrees of participation, and some methods by which public participation can be fostered. "Community-based decision making" (section 4) will try to illustrate the benefits of making certain decisions nearest to the project and with the involvement of the community.

2. Building new industry-government-community partnerships

2.1 Why partnerships? With whom?

The idea that mineral development must be carried out in partnership is relatively new. In the early days of Western industrialization, a company and its officers prided themselves on their independence. Later the realization grew that business benefits in the long term by recognizing that its interests are interdependent with the interests of other groups in society. The concept of corporate responsibility has now been widely accepted.

In past decades, many mining companies probably felt that the job of resource development belonged solely to them. While government's job was to provide a stable legal framework, industry preferred government to stay in the background and not get involved in specific developments. Regulation was considered an annoyance; the less regulation the better.

Later, industry came to accept that both the company and the government have a legitimate role in mineral development. Company presidents began to speak of government as a legitimate partner, particularly when governments provided infrastructure as part of the overall development.

More recently, companies have begun to realize that the communities affected by mining development have a role to play in making decisions about that development. The concept of the community as a partner is gaining acceptance. For mineral development to proceed without

problems, all partners, including the community, must be satisfied that their interests have been considered.

But what is a "community"? The relevant definition of community varies, depending on the situation. For some purposes (e.g. local impacts), the community may be simply the village near the mine site. For other purposes, (such as the impact of exports on exchange rates), the community may be the whole nation. In the latter situation, many interests are affected, and many "stakeholder" groups are part of the national community. These wider interests must be included in the partnership concept.

2.2 Basic principles of partnership

The following principles represent an ideal towards which partners may strive. While always desirable, they are of course not always fully present in actual partnerships.

- *Mutual benefit.* Every partner must believe that the partnership brings it benefits.
- *Mutual responsibility.* Every partner must feel a sense of responsibility towards the other partners.
- *Long-term relationship.* Especially with mineral development, where investment and production take place over many years, all partners must be prepared to nurture a lasting relationship, which will require give-and-take.
- *Clear, realistic expectations.* Partners must enter the relationship with a clear idea of its costs and benefits to themselves and to the other partners.
- *Information, openness, honesty.* All parties must be prepared to communicate true and reliable information (and all the information) to their partners. It is better to convey an unwelcome message, even risking a disagreeable discussion, than to hold back such information.
- *Predictability, consistency.* All parties must behave in a consistent way. This does not mean that they must always be pleasant to each other, but their behaviour must be predictable. Experienced partners do not like surprises, and they try not to give surprises.
- *Trust.*Trust is not automatic. It cannot be legislated. Trust has to be earned. It is a result, an outcome of something else. Trust will grow over time if all partners display honest, open communications and consistent behaviour.

2.3 Areas in which partnerships may be formed

Partnerships may exist at many levels and in many areas. The following illustrations show only a few of the possible examples. In any of the areas shown here, problems can arise. However, using foresight and thinking in partnership terms may help to avoid them.

In some countries, the legal and regulatory framework is fairly complete and the obligations of the parties are fully spelt out. Even in these countries, however, there has been a tendency in recent years towards policy change, leading to friction between industry, government and other groups. Companies and governments are now seeking innovative ways of preventing conflict, including the use of partnership-type thinking.

In other countries, the framework is more flexible. The rights and obligations of the parties are established by negotiation. It is in this situation that the concept of partnership may have special application.

2.4 Exploration, project investment and approvals

This is the most fundamental area of partnership or conflict between the mining company and the State because it is the beginning of what may become a long-term relationship. A negative experience at this time may sour the relationship for many years. Assume for the purpose of this example that the legal and financial arrangements between the mining company and the host country must be established by negotiation.

Before an investment is permitted, or an exploration permit granted, the company must satisfy the government that it has the capacity and the will to create an economic entity which will be of lasting benefit to the host country. It may submit extensive technical and financial details to the host government. The government may or may not accept these data at face value, but in any case will probably draw on independent experts to assist in its evaluation of the submissions.

For its part, the company will expect the host government to offer a stable legal and regulatory framework. It will probably seek assurances that sudden and unpredictable changes will not be made in legal or regulatory requirements, or in taxation arrangements. The company may accept that changing future conditions require that its arrangements evolve over time. However, it will expect any such changes to take its interests and original expectations into account. Methods of putting these changes into effect may well be spelt out in the original agreement.

Eventually, complex legal agreements will probably be drawn up that describe the rights and obligations of each party. When these are complete, the investment is made and construction begins.

For the best and most lasting results, the parties to the negotiations should observe the principles involved in building partnerships. If both parties communicate openly and bear in mind the balance of mutual benefit and mutual responsibility, a high degree of trust and satisfaction may result. If not, the negotiations may leave a legacy of distrust and dissatisfaction. An uneasy and unstable truce may follow, instead of the desired partnership. For maximum long-term satisfaction and stability, both the company and the host government will find it beneficial to involve affected communities and stakeholder groups during the negotiations.

2.5 Potential environmental partnerships

2.5.1 Use of local and traditional knowledge

During planning activities prior to project-permitting, the mining company and the host government could invite local people to act as partners, contributing their special detailed knowledge regarding local conditions and wildlife populations. In the case of indigenous peoples in certain countries, the use of traditional knowledge has helped project proponents to avoid or minimize damage to the area's natural heritage and to the peoples' cultural heritage.

2.5.2 Cooperative baseline studies

The same approach, using local knowledge, can be carried further. Environmental baseline studies consist of a detailed survey of the area, leading to a cataloguing of all the species of plants and animals which are present, together with significant physical data regarding, for example, soil conditions and precipitation. These studies provide a basis for the project's environmental impact assessment and permit the use of mitigatory measures in project design. They are usually financed by the project proponent and carried out by consultants.

In order to involve local people as partners, the community can be asked by the proponent to act as the general contractor for any environmental baseline studies. The proponent would still pay, and the studies would still be carried out by consultants (under the community's direction). However, there would be three advantages: the community would get to know both the project and the company; it would be involved from the beginning in decision-making; and it might also reap some financial benefit.

2.5.3 Community role in monitoring environmental performance

Once the project has been completed and is in operation, a local partnership arrangement could supplement or replace environmental monitoring and inspection by a government agency. Under the direction of a local liaison committee, a trained local person or company employee would periodically gather data on all relevant measures of the mine's environmental performance and release it to the company, to the community and to the host government.

2.6 Potential community and regional development partnerships

2.6.1 Cooperative social and cultural impact studies

Social and cultural impact studies are often required before a major mining project is undertaken, especially where there is little other industrial development in the region. As in the case of environmental baseline studies, some mining proponents have contracted with the local community to spearhead or carry out the study of the mine's social and economic impact on the local population. The scope of the study and its terms of reference are negotiated between the company, the community and the central government. While the community may need to obtain outside expertise in carrying out the study, the involvement of local people adds detail and credibility to the findings.

2.6.2 Development of local business opportunities

In addition to employment, local people often seek new business opportunities when a large industrial project is created. There are many cases where a local business person or group supplies catering, transportation, construction or other services to a mine. A mine's acceptability to local populations is greater when community businesses profit from the development. Sometimes, especially where industrial development is new to a region, the local business community does not possess the skills or the capital to take full advantage of the opportunities. The host government and

the company may need to work in partnership with local institutions to create the necessary pools of skills and capital.

2.6.3 Cooperative infrastructure development

A large mining development may require new transportation and communications infrastructure. Also, it may build a new townsite complete with full community infrastructure such as housing, schools and municipal services. Usually, all of this is provided by the mining company to serve its own needs. In some cases, existing communities do not benefit from these additional facilities (in fact, negative impacts can result). The result can be dissatisfaction and resentment unless a way is found for local populations to share in the benefits. A cooperative partnership between the company, the community and the State may permit certain services to be extended to the local community at small incremental cost. These may be in the areas of medical services, water supplies, communication facilities, and so forth.

2.7 Potential science and technology partnerships

2.7.1 Cooperative definition of science and technology needs.

Before the detailed design of mine facilities and processes, the company will normally carry out extensive site investigations to determine the physical, geotechnical and topographical characteristics of the site, as well as the climatic conditions prevailing in the region. Environmental baseline studies will also be required in order to document the area's ecology and to permit the design of any protective measures required to mitigate environmental impacts. Socio-economic studies may be required in some cases in order to identify potential impacts on local communities. These factors will all affect the company's choice of project design and production technology. It may be useful for the company to involve the government (or its consultants) and local people in the design of these studies. By doing so, the company can ensure that the studies cover all aspects of the local conditions. Such a partnership approach builds confidence and understanding of the project among local people and may avoid future problems. It also forms a solid basis for agreement on the choice of technology and other aspects of design.

2.7.2 Selection of appropriate technology to fit local conditions

In planning the development and designing the mine, companies will normally employ both their own technical staff and specialized consultants. Multinational companies have access to, and normally use, the latest technologies and advanced techniques to obtain the best overall result in terms of resource recovery, optimum use of capital and labour, and environmental protection. However, even the latest technology does not have all the answers in terms of scientific certainty. It would be appropriate for the government to work cooperatively with the company to evaluate whether all the relevant risks and opportunities have been assessed in the choice of technology. If significant knowledge gaps exist, appropriate research programmes can be undertaken.

2.7.3 Cooperative research and monitoring programmes on environmental and social issues

Even after the specific mining and processing methods have been chosen and implemented, there may be a need for cooperative monitoring and research. All parties wish to be assured that the environmental and social impacts of the mine are benign and that any mitigatory measures are effective. The knowledge gained from cooperative monitoring programmes will help the company and host government to document the actual impacts. The resulting evidence will be useful in ensuring that, rather than matters being left to the imagination, the public has accurate data. It will also provide a basis for remedial action if required.

2.8 Potential human resources development and capacity-building partnerships

2.8.1 Cooperative definition of skill needs, availability and gaps

The potential for local people to derive maximum benefits from a new mining development is often limited by the range of skills present in the community. All too often, particularly in rural and remote areas, the local population lacks an adequate level of formal education.The basic skills of reading and arithmetic may be deficient. Until individuals have such skills, it is virtually impossible to offer them the vocational training needed for employment in today's mining industry. Similarly, the ability of local individuals and organizations to take advantage of potential business opportunities is sometimes limited by lack of basic business skills, including bookkeeping. At the earliest possible moment in planning for a new mine, it would be advantageous for the company, the government and the community to cooperate in making an inventory of the skills available locally. If gaps exist between what is available and what is needed, the necessary skills upgrading and training programmes can be planned for and initiated without delay. It is probable that the inventory may also reveal specialized skills peculiar to the region. Skilled hunters, gatherers or artisans, for example, may have special local knowledge which may assist all partners in achieving development objectives.

2.8.2 Cooperative design of programs for skills upgrading and occupational training

Following a skills inventory, the three partners (company, government and community) can consider how to proceed with programmes for skills upgrading and vocational training. Each partner has something to contribute to the discussion. Each has interests and needs which should be respected. Joint or coordinated planning is likely to lead to a more satisfactory result for each partner than independent planning.

2.8.3 Implementation of coordinated programmes for upgrading basic and business skills and providing occupational training

The delivery of educational and training programmes can also be effected in a cooperative fashion. For manpower planning purposes, the company needs to know how many potential local employees are available, and when their skills will be adequate to allow them to undertake vocational training. At the same time, local residents need to know that employment opportunities will be available if they invest their efforts in educational pursuits. Although the partners' activities

should be coordinated, their respective responsibilities must be clearly defined. In most cases, companies expect the government to be responsible for providing the basic skills and general education to local people, whereas vocational training specific to mining will be the company's responsibility.

3. Public participation in decision-making

So far the discussion has been about the concept of partnerships between the mining company, the government and the community. How does the issue of public participation in decision making relate to partnership in mining developments?

The concept of participation in decision-making is of course implicit in the concept of partnership. It is difficult to conceive of a partnership in which all the partners do not have a say in its activities.

But public participation is a technique of wider application. It can be used to avoid problems in a great variety of decisions connected with mineral development. Public participation is often useful in situations where partnerships are inappropriate or simply lacking. It can serve to improve decisions and make them more acceptable to those people who will be affected by them.

This section will discuss four topics: Purposes of participation; degrees of participation; opportunities for participation; and processes of participation.

3.1 Purposes of participation

3.1.1 Recognizing role and needs of "stakeholders"

Stakeholders are all those people who have a stake in a decision; that is, those who are affected by a decision. The term is adapted from the game of poker and from the term "stockholders". It is now widely used to recognize that business managers have responsibilities to the public which go beyond their traditional duties to the owners of the business. The concept of stakeholder applies equally well to any group of people who are affected by a government decision. Even if there were no practical reasons to involve stakeholders in decision-making, the ethical principle of fair treatment would entitle them to participate to some degree.

3.1.2 Improving decisions

If all those communities and interests which are affected have a say in the decision, it is probable that the decision itself will be a better decision. That is, it will accomplish its purpose more effectively. The more interests are considered in making the decision, the more it will ensure that all relevant factors have been considered, internalize all the trade-offs and reflect an appropriate balance of interests.

3.1.3 Increasing acceptability of decisions

People tend to fear the unknown. Participating in a decision helps stakeholders to become familiar with the project and discover that the impact may be more benign than they had imagined. They also have an opportunity to appreciate the complexity of issues and to comprehend the concerns of other groups. A decision which has had input from a range of interests is therefore likely to be more acceptable to all groups.

3.1.4 Easing implementation of decisions

When the time comes to carry out the decision, opposition may arise if those affected by it have not had an opportunity to influence it. This opposition may delay or eventually defeat the desired goal. Participation at an early stage may avoid future opposition.

3.1.5 Speeding development

Large mining development projects may have a substantial impact on the landscape and on the lifestyle of those in the vicinity of the mine. Yet the authority to approve a mining project often lies with the central government. If approval is given without the involvement of the local community or other stakeholder groups, opposition may arise and delay construction. In some cases, taking a little time to involve the community may actually avoid later delays and shorten the time until construction begins.

3.2 Degrees of participation

The public, affected communities and interest groups may participate in decision making in many different ways. Each method brings with it a greater or lesser degree of involvement and influence. The lowest degree of participation is obviously not to be consulted or involved at all. This method is probably still current with some companies and governments.

3.2.1 Information

Some proponents and governments see value in informing the public about a proposed mining project. This has the advantage of providing some basis for understanding. It is certainly preferable to allowing construction activities to be a complete surprise.

3.2.2 Consultation

In some cases, the company and the government provide basic information and invite comment from the public. The response is valuable, as it provides an opportunity to assess public reaction, avoid surprises and possibly alter troublesome aspects of the project.

3.2.3 Involvement

Involvement usually implies some continuity of contact between decision makers and the public. The public is "involved" in some more active way, possibly through ongoing structured consultation processes and advisory committees. Involvement requires a two-way exchange of views between the decision makers and the public. It produces a deeper understanding, on all sides, of the nature of the project and the views of the public.

3.2.4 Influence

Consultation with, and involvement of, the public may take place with or without influence. Influence exists when the decision makers are prepared to listen actively to the views of the public and to take some action as a result of listening. The project may be modified in some ways when public influence is a factor.

3.2.5 Shared decision-making

In some areas, final decisions must be made by the government or the company. In other fields it may be appropriate to share the decision-making power with the public, including with the community. It is inappropriate for the community to have a veto over major aspects of the project. But as regards other aspects, where the interests and the expertise of the community predominate, the decision may be made jointly with the community, or it may be delegated completely to the community.

3.3 Opportunities for participation

3.3.1 Policy-making

Through the national government, the public has a clear role in policy-making. Depending on the jurisdiction, the public, as well as specific interest groups and communities, may be involved to a greater or lesser degree in establishing the legislative and regulatory framework. Lack of public involvement in policy making can create the potential for future instability. On the other hand, involving the public may help to build the stable and predictable policy environment that is needed to attract mineral investment.

3.3.2 Land use decisions and regional planning

At the regional level, there may be a role for the public in deciding which land uses are acceptable in particular areas. Ideally, these decisions will have been made well before mineral exploration and development begin. Suppose a mining company is allowed to explore in a certain area and is fortunate enough to discover a valuable ore body. If the right to mine in the area is subsequently taken away by an adverse land use decision, a great deal of frustration will result.

3.3.3 Project assessments

In a number of countries today the public is invited to participate in environmental assessment processes. Such participation may vary from simple information exchange, through consultative processes, all the way to formal hearings. In Canada, formal panel hearings are confined to major mining projects. Smaller projects are assessed by government officials with public input.

3.3.4 Operational phase

Once the mine is in operation, the regulatory process, including inspections, monitoring and reporting, may be bilateral (strictly between the company and the government) or it may involve the public through a public liaison committee or other monitoring body. The proponent of a diamond mine in northern Canada has recently proposed that monitoring be carried out by an independent body of citizens drawn from the region and the community.

3.3.5 Planning for closure

The mining legislation in most parts of Canada now specifies that closure plans must be submitted with initial mining project proposals, and updated throughout the life of the mine. These plans are public documents and the public is invited to comment. A closure plan for several uranium mines was recently subjected to a formal assessment, including public hearings, before it was approved by government.

3.3.6 Post-closure phase

After closure, most mine sites require periodic monitoring. Some require active maintenance for many years. These activities can often be carried out by local citizens with guidance from technical experts.

3.4 Processes for participation

3.4.1 Local, regional or national?

Depending on the issue to be decided, the public may be involved on a local scale, a regional scale or a national scale. It is desirable that the scale of consultation be determined in advance and communicated to the public so that misunderstandings are avoided.

3.4.2 Information meetings (open houses)

Most developers are accustomed to meeting with the affected public or community as the project is developed. Plans or models of the project are usually shown, questions are answered, and comments are received. Both the information provided and the comments received are normally

rather superficial. Unless these meetings are periodically repeated, this type of participation is characterized as information exchange. It falls far short of full public involvement.

3.4.3 Surveys and consultation documents

In some cases, the public can be surveyed by questionnaire. This is likely to reveal those attitudes that are uppermost in people's minds. However, more thoughtful insights can be obtained if consultation documents or meetings are provided which clearly set out the options and considerations that are involved in the decision.

3.4.4 Hearings, panels

Formal panel hearings usually offer only one-time opportunities for involvement, often when a project is seeking final approval before construction begins. These processes are commonly structured to allow for in-depth discussion of the project and serious exploration of the public's views. Hearings are especially valuable when the panel goes to the community. Unless carefully managed, however, the legalistic nature of hearings can stifle valuable discussion and inhibit participation, particularly in rural or remote communities.

3.4.5 Liaison committees, advisory committees or boards, and co-management boards

All these mechanisms provide opportunities for the public to have ongoing involvement with the project. They are particularly suitable for involving the local community on a continuing basis. As outlined here, liaison committees may have some influence in operational decisions, advisory committees or advisory boards may have more influence, and co-management boards may have shared decision-making powers. In any of these three bodies, membership should be structured to ensure that a number of interests and stakeholder groups are represented.

4. Community-based decision-making

This section will discuss a special case of public participation, namely the direct involvement of the community in the decisions relating to a mining development. As before, the definition of "community" is somewhat elastic. Depending on the scope of the project and the issue to be decided, the relevant community may be local, or it may include people spread over a much larger geographical area, even extending to the whole nation. However, it will be most helpful for our immediate purposes to focus on the local community. We will begin by examining why community-based decision-making may be appropriate and how it may be carried out. Along the way, we will suggest a general principle that may assist in deciding when community-based decision-making is appropriate.

4.1 Purposes of community-based decision-making

Community-based decision-making is a special case of public involvement or participation

in decision-making. It has all the advantages we have discussed:

- Recognizing the role and needs of the community
- Improving decisions
- Increasing acceptability of decisions
- Easing implementation of decisions
- Speeding development

In addition, this form of decision-making has one unique advantage; it *ensures that the community benefits from development*. If all planning is carried out without community input, it is probable that some opportunities to meet the community's needs will be missed. It makes sense to allow the community to help shape the development proposal so that the best mix of benefits to the developer, the host country and the local community is achieved.

4.2 Principle of community-based decision-making

As a general guide, the following principle has been found helpful in locating the focus of decision-making:

The best decisions are those that are made closest to the people most affected by the decision.

This principle recognizes that decisions may be made at various levels. A few years ago, it would not be uncommon to find that most decisions about a mining project were made by the company, once the legal framework had been established. Later, many governments developed the expertise and ability to influence the project plan in order to meet their own development objectives more fully. Nowadays, there appear to be valid reasons to involve the communities and seek their input where appropriate.

This is not to say that all decisions are to be made locally. Indeed, the specialized technical expertise needed for some decisions may only be available nationally or even internationally. These decisions must be made at the appropriate level, often remote from the community.

Nevertheless, local people often know most about their own needs and wants, and they have specialized knowledge of local conditions. Where these intellectual resources can contribute to better decisions, it makes sense to use them.

In a large federal State such as Canada, it often seems that officials of the national government are far removed from the people affected by its decisions. Deciding matters on the basis of abstract principles without the influence of those most affected may cause delays and introduce a sense of unreality.

4.3 Methods of community-based decision-making

Various structures may be established to facilitate local input into decisions.

4.3.1 Community liaison committees

These may be designed to function primarily as channels for information exchange between the community and the company. Initially, the company may neither intend nor be obliged to take advice from the committee. As it gains experience and competence, however, the committee may gain more influence over decisions affecting the local population.

4.3.2 Advisory boards

Here the advisory function is part of the initial mandate of the liaison committee. A clear understanding is needed regarding the areas in which the advisory board is competent to give advice and the degree to which this advice is binding on the company. Operational decisions affecting the basic technology and operating procedures are not generally considered appropriate subjects for shared decision-making. The company, which is responsible for the operation, must be free to make operational decisions.

This is the rule even when the mine is a joint venture between two companies. One of the companies will be designated as operator. The other will have the right to monitor the operation but cannot interfere with it.

A special case of advisory boards operating at the community level is the Nanisivik Mine in northern Canada. Here the mine's Board of Directors included a representative of the Aboriginal community.

4.3.3 Co-management boards

For reasons given in the last section, co-management boards are unlikely to yield satisfactory results. They will therefore not be considered further.

4.4 Design of community liaison committees or advisory boards

Since community liaison committees and advisory boards differ only in the degree of their influence on decision-making, the structure and function of both types will be discussed at the same time.

Both types of committee should *reflect community composition*. That is, they should be composed of a representative cross-section of the relevant community, whether local, regional or national. In particular, the group should *involve all major interests and groups* in the community. It should include business people whose economic future depends in part on the ability to supply goods and services to the mine, and representatives of the local or regional government. It should also include representative environmental or social non-governmental organizations. Having such a *balance of interests is vital*. This mix will ensure that all viewpoints are considered and that any decisions or recommendations by the group have been tested against reality. Showing respect for all points of view in this way will also tend to prevent future disputes.

As indicated earlier, the group's *degree of influence may grow with experience*. As it gains a firmer grasp of the issues over time, controversy tends to diminish. Different members of the group begin to reach a consensus on the proper course of action.

It should be stressed that the function of these advisory structures falls short of co-management. The *operating company must retain final decision-making authority, but it must equally be responsive to community wishes and concerns if conflict is to be avoided.*

5. Conclusion

It has been shown that the use of partnerships and public participation can have many advantages in the development of mineral resources. A development project that clearly identifies and pursues the needs and wants of the company, the government and the community will in the long run be the most satisfactory and most profitable. As indicated, the accommodations involved will not always be easy. However, the use of some of the concepts and techniques presented at this workshop may help the State, the company and the community to build a lasting partnership founded on mutual advantage and trust.

An integrated methodology for assessing the social and cultural impact of mining

Allen L. Clark and Jennifer Cook Clark

1. Introduction

To date, very little applied research has been undertaken at the micro-economic level to define the economic impacts of a medium- to large-scale mine on the local economy in terms of costs and benefits associated with the resulting changes in social and cultural patterns and values. Indeed, at present, there is no generally accepted methodology by which these parameters can be measured. As can be seen from the following list, existing methodologies range from assessments based on degree of conformity with national policy to those which attempt to establish non-market determined values:

- Conformity with national development policy objectives
- Benefit-cost analysis
- Contingent evaluation
- Cost effectiveness
- Input-output analysis
- Impact assessment
- Alternative land use analysis
- Sustainability planning

Taken individually, none of these methodologies can provide an economic assessment of social and cultural values, for one or more of the following reasons:

- Difficulty in quantifying social values in monetary terms
- Inadequacies of measurements in a non-cash economy
- Differing value systems
- Inability to define a valid and consistent authority
- Difficulty in assessing near-term versus long-term impacts
- Differing concepts of the time value of money
- Difficulties in defining interacting social-cultural values and economics
- Difficulties in accounting for intergenerational equity

Because of these deficiencies, a new methodology, which draws upon the strengths of the existing methodologies and deals with their inadequacies, needs to be devised. It is the purpose of this paper to outline a procedure to be followed in the development of a methodology and to describe the actual components of the methodology.

2. Developing a methodology

Essential to the development of any methodology is the need first to define the primary objectives of the proposed methodology. The first objective is to define the economic, social, cultural and political impacts of a medium- to large-scale mining enterprise on the associated local community. Second, the direct benefits and costs, in economic terms, of the mining enterprise for

the existing economy should be assessed: from exploration through development, mining and closure. Third, the benefits and costs of the impact of the mining-generated economy on the social and cultural values of the local populations need to be assessed (where possible in economic terms). The fourth objective is to evaluate, on the basis of the activities already mentioned, the ability of initial planning activities to anticipate and accommodate changes in the existing economy and associated changes in social and cultural values and patterns. The fifth objective is to develop an integrated economic-social-cultural methodology for general use in evaluating mining developments in other areas, with applicability to a broad range of large-scale development activities which impact on existing economies, societies and cultures in remote areas. Finally, both the methodology and the appropriate background data should be made available for use by other researchers, development specialists, governments and industry.

To meet these objectives it is necessary to assess the nature of the environment within which the methodology will be applied. This requires the assessment of a number of factors, including the present level of development, availability of data, anticipated size of operations and mine life, the diversity of impacted social, cultural and economic groups, the presence or absence of a mining history, anticipated levels and areas of potential conflict, and previous experience.

The next step is to clearly define, on the basis of the assessments, the products that are desired and that can be produced. To do this, a clear statement of assumptions and an assessment of overall impact need to be developed. Furthermore, social and cultural costs and benefits need to be quantified and a time frame for impacts, benefits and costs has to be defined. It is also important to define what is already known and what needs to be determined. Finally, a framework for continuous monitoring and assessment has to be developed.

3. Proposed methodology

The proposed methodology consists of three major elements: (i) the preparation of a benefit-cost analysis of the impact of the mine on the local economy; (ii) the development and preparation of an analysis of the benefits and costs of economic development in terms of their impact on the social and cultural patterns of the indigenous population; and (iii) an integration of activities (i) and (ii) into an overall analysis of the economic, social and cultural benefits and costs of the mine development for the local population.

The *benefit-cost analysis* of the impact of the mine on the local economy should be based on previous studies of the economy of the proposed mine area, and in particular the area immediately adjacent to the mine, and should consist of a baseline field assessment of the present economy in the form of a standard benefit-cost analysis. Although the study would encompass the entire economy, particular emphasis should be placed on the collection of specific data which facilitate the benefit-cost analysis by measuring changes in:

- Family income
- Commodity prices
- Income distribution
- The monetary economy
- Proportion of the community that is part of the monetary economy
- Demographics of involvement in the monetary economy

- Land ownership
- Social services (health, education, welfare)
- Land utilization
- Capital creation
- Compensation payments
- Shared income

These data will provide not only an overview of the benefits and costs associated with the direct impact of the mine on the economy but also information about areas where changes in the economy are expected to result in corresponding changes in social and cultural characteristics.

The measuring of benefits and costs of economic development in terms of their impact on the social and cultural characteristics of the indigenous population is to a large extent a new field of research for which few if any analytical procedures have been tested. From the outset, it is expected that far more social and cultural changes will be identified than can be quantified in terms of economic benefits and costs. Nevertheless, factors such as changes in land value, compensation rates, increased informal economic activity and others can be defined and quantified, all of which will make a major contribution to quantifying the impact of the mine.

To carry out this research work, a social anthropologist, familiar with the local culture and fluent in the local language and dialects, should undertake a preliminary sampling of views. Using an open-ended ethnographic approach, the following contrasts would be assessed: old/young, male/female, regional/local (villagers from the area and near the mine site), land owners/non-land owners, mine workers/non-mine workers, and possibly religion/church.

On the basis of this initial survey, the social anthropologist in cooperation with other team members would formulate a more precise set of questions for follow-up interviews. These questions would focus on providing quantitative data for benefit-cost analysis and would take into account comparisons with local perceptions of value, ownership and transferability from earlier studies.

Integration and analysis would consist of an integration of the results of the earlier activities to provide a benefit-cost analysis of both the direct economic effects of the mine on the local cash economy and the direct and indirect benefits and costs of the mine's impact on social organization and cultural values among the local population. The resulting analysis would provide a comprehensive and qualitative evaluation of the direct economic impact of the mine on the local economy as well as a subjective evaluation of the direct and indirect economic impact on the social perceptions and cultural values of the local population.

The first of the specific research tasks to be undertaken would be a compilation of historical baseline data. Available data on the mine area pertaining to the project's areas of study would be collected and reviewed to develop a "historical status report" on the economy, population, social structure and culture of the area prior to exploration and development.

Second, in the context of mine development planning, a synopsis of activities, undertaken by all parties, including government, industry and other involved research groups, would be prepared which would document economic, social and cultural issues anticipated and addressed prior to mining. Particular emphasis should be placed on defining the specific actions planned and taken, by both government and industry, to ensure the orderly and acceptable development of the

mine with minimal local impact.

Third, detailed field studies would be conducted to determine the present state of the cash economy associated with the mine area and a benefit-cost analysis made with respect to the economy.

Fourth, the social-cultural benefit-cost analysis would be undertaken, including the initial ethnographic survey of local attitudes by a social anthropologist, and the subsequent follow-up interviews to quantify social and cultural values. Results of both analyses would be integrated into a comprehensive evaluation.

Fifth, on the basis of the integrated benefit-cost analysis, an evaluation of past and present planning by government and the mining industry would be prepared and compared with local perceptions of benefits and costs associated with the mine. In addition, an analysis of the social and cultural impacts of the mining activity, through its impact on the formal and informal economy, would be made.

The final products to be derived from the evaluation would consist of a detailed methodology, with supporting data, for the analysis of the impact of a medium- to large-scale mine on the economic, social and cultural structure of local populations and areas. Since the methodology would integrate analytical techniques of both economic and social anthropological studies, it would constitute an initial effort in a field where there has been virtually no research or publications. In addition, a final report, accompanied by an appendix containing economic-social-cultural data for the mine, would serve as a source document for all parties.

3. Relationship to other development initiatives

The proposed methodology should be of both direct and broad value in terms of mineral-development-related projects and medium- to large-scale development projects in other sectors as well. Within the minerals sector, recent events such as those on Bougainville clearly demonstrate the need for an analytical methodology which incorporates not only direct economic benefits and costs into local planning and policy but also the associated benefits and costs of economic development for local social institutions and cultural values. Clearly, in the Bougainville case, failure to anticipate and incorporate these micro-economic factors into macro-economic analyses and planning by government and industry was a major factor in the mine's ultimate closure.

More broadly, but equally important, the methodology should be directly applicable to other efforts in the area of sustainable development. The proposed methodology directly addresses the key issue of coincident economic and social/cultural development and evolution as a key to sustainable development. In presenting an analytical methodology for integrating both direct economic and indirect social and cultural benefits and costs flowing from development, the methodology could be an essential building block in analysis and policy development. It would be expected to have a potential for more general application in assessing the social and cultural benefits and costs of development projects such as infrastructure, energy and major construction in remote areas. The integration of economic, social and cultural factors, in economic terms, could also be used directly in traditional macro-economic impact analyses and in national development planning and policy.

The proposed methodology represents an attempt to evaluate two specific areas of economic impact in respect of which there has been little or no previous research and the technical literature is virtually non-existent. As such, the methodology could be a significant contribution to undertaking applied programmes in defining at the micro-economic level the impact of a medium- to large-scale mining venture on a local economy and on the social institutions and cultural values of the people and the area.

The Misima mine: An assesssment of social and cultural issues and programmes

Allen L. Clark and Jennifer Cook Clark

1. Introduction

During the 1980s and 1990s there has been a worldwide trend towards the development of medium- to large-scale mines (such mines typically require a capital investment of US$200-500 million or more and have lives of 5-15 years or more). These mines have most recently been primarily gold mines, although a substantial number have been developed for other commodities. The trend towards more medium- and large-scale mines with only a few "world class" mines (requiring investments of US$1,000 million or more) has resulted in the effects of mining development being spread across many different communities, often in remote locations. This trend is likely to continue, and probably accelerate, since many nations (Brazil, Chile, China, Indonesia, the Philippines, the United Republic of Tanzania, Viet Nam and Zimbabwe are examples) are actively promoting the medium- to large-scale mining sector as a national priority.

As a result of the increase in medium- to large-scale mines in remote areas, mining developments are impacting on local communities and areas, which are in turn responding - both positively and negatively - to such developments. In particular, the local communities are exercising a more dominant role, in many cases equal to that of the national government and the mining industry, in determining the economic, environmental, social and cultural impacts that are allowable for any specific development. To a greater or lesser extent, depending on the community or area, there is a very poor understanding of the economic impact of a mining venture on the local economy and the social and cultural structure of those affected. The tendency in most developments in the past has been to determine the parameters of development through negotiation between government and the mine developer and to view mine development in terms of macro-economic factors at a national or corporate level. The result has been a virtual exclusion of the local community from the development process and from full economic participation in the project.

The general enthusiasm which initially greeted the rapid development of these mines in different communities has recently been considerably dampened by the recognition of numerous present and future downside effects associated with these developments. These effects include:

- disruption of the indigenous society and culture;
- disruption of the physical environment;
- local inflation or hyperinflation;
- problems of revenue distribution;
- increased cost of government services;
- increased prevalence of disease;
- creation of "haves" and "have nots";
- introduction of "outsiders" and expatriates, who are not necessarily welcomed by local residents, and
- unequal distribution of decision-making authority between local and national authorities.

Although the above effects occur for "world class" mines as well as for medium- to large-scale mine developments, they are accentuated in the case of the latter developments because:

- The anticipated mine life is relatively short (15-25 years), requiring in many cases concurrent planning for opening and closing;

- Multiplier effects are smaller in many cases because of the scale, mechanization and duration of the enterprise;

- Ancillary support facilities, such as schools, hospitals and housing, are reduced;

- Social, cultural and environmental disruptions are intensified as a result of the shortened time scale; and

- National government interest is lessened because of the scale of revenues generated, thus increasing the burden on the local government.

For many mining developments the local impacts occur and are exacerbated for a number of reasons directly related to the generally remote nature of the areas where the mining activities are undertaken.

First, and perhaps most important, the local area and peoples have a very low absorptive capacity for rapid development activities, primarily because of lack of previous exposure and familiarity with any large-scale commercial mining activity.

Second, the introduction of a new and large cash economy into the area results in the destruction or substantial modification of many existing social and cultural institutions, the creation of "haves" and "have nots" within society, and rapid economic development which is difficult to control.

Third, there are fundamental problems associated with health and education, which in most areas are of a low standard at the time of the mine's development.. This limits local participation and the ability to understand mining development and its impacts, and hence the ability of communities to make informed decisions about many activities associated with the mining enterprise.

Fourth, the distance from the provincial and national centre of decision-making limits direct input by the local communities on matters of primary concern. In many cases the situation is made worse by low levels of staffing at the provincial and local levels of government. This lack of a competent intermediary between the mine developer and the local population further reduces the ability of the local community to participate in mining activities and to have a say in mitigating adverse effects.

Fifth, there is usually little or no physical infrastructure (roads, power, water etc.). Therefore, local impacts, particularly during the construction phase, are both profound and the source of numerous adverse impacts.

Although the regional and national impacts of "world class" mining developments have been the subject of considerable research and numerous publications (Bosson and Varon 1977; Mikesell 1983; Pintz 1984; Cordes 1988), such studies have emphasized primarily the macro-economic issues of revenues to government, revenue distribution and impact on overall development.

Additionally, such studies have focused on the mining activity as an "enclave" activity with few external impacts.

In general, the impacts of medium- to large-scale mining on the local area and peoples are rarely dealt with in detail except as regards environmental considerations. This is not to say that many new medium- to large-scale mining developments are not required to undertake, and have not undertaken, detailed social and cultural studies, but rather that such studies are a relatively new and isolated phenomenon, that they have rarely if ever been integrated with other impact studies, and that they have not been the subject of either significant research or publications.

An example of the immediate need for and importance of such research is evidenced by recent events, which resulted in the closing of the Bougainville (Panguna) mine on Bougainville Island. This closure can be traced to numerous historical and recent causes. However, regardless of the relative importance of specific factors, the basic fact remains that the inability to deal effectively with a range of economic, social, cultural and environmental issues led to the closure of one of the world's largest mines, disrupted the economy of Papua New Guinea, caused a schism between the national government and the provincial government which led to an armed rebellion and had a profound effect on other mining ventures in Papua New Guinea and elsewhere in the region (particularly in Fiji, Indonesia, the Philippines and the Solomon Islands,).

If such issues can close a "world class" mine, their importance to a medium- to large-scale one is even more critical. Moreover, it should not be thought that these are localized issues within the Asia-Pacific region, because similar problems exist in other countries, including Brazil, China, Colombia, Costa Rica, Ghana and the United Republic of Tanzania. It is therefore critical that the local issues surrounding a mining development be addressed and that options be developed to resolve or mitigate their impacts and resulting social, economic and political disruptions. The Misima mine, currently operating on Misima Island in Papua New Guinea, provides an ideal case history on the basis of which to analyze these issues. Misima Island is a part of the southern islands of the Papua New Guinea archipelago, approximately midway between mainland Papua New Guinea and the Solomon Islands to the south-east.

2. The Misima mine study area

The Misima mine is a highly suitable study area in that a major modern mining venture has been undertaken on a relatively undeveloped island, with a fragile environment, and in a society which continues to draw upon traditional values and mores. More important, it represents a situation within which national government, provincial government, local citizens and enterprises and the mining company have worked, and continue to work, to avoid conflict, resolve issues and mitigate negative impacts on the indigenous population, environment and culture. Such efforts have been the hallmark of the project from the initial exploration phase through development and present-day mining, and will continue until the mine is closed.

Misima Island is 40 kilometres long and 10 kilometres wide at its broadest point, and the Misima gold deposit is located on the eastern part of the island. The topography of the island is rugged, with the eastern portion comparatively less rugged than the western portion. The highest point, which is on the western part of the island, is 1,035 metres above sea level. The island is covered in lowland hill rain forest except for the coastal zone and the foothills, which have been

cleared for cultivation and replaced by woodland.

The population of Misima Island is approximately 9,000, divided into 10 clans which own the island, living in some 20 villages located in the coastal zone. The islanders depend on subsistence farming and practise shift cultivation characterized by mixed farming. Yam and taro (root crops) are the main staple crops. Subsistence farming is confined to foothills and areas of the mountainous interior cleared by slash-and-burn techniques. Cash crops on the island are copra, cocoa and coffee, copra being the most important. These crops utilize almost all the flat coastal land, which is formed on raised coral limestone terraces. The islanders depend on fish and shellfish from the surrounding sea for their main source of protein. It was into this largely subsistence agriculture environment that the Misima mine was introduced.

Initial mineral exploration (post-Second World War) began in the area of the present day Misima mine in 1977 but was actively pursued only in 1985 when Placer Pacific (formerly Placer Mining) acquired a 100 per cent interest in the property. In December 1987, a Special Mining Lease for 21 years was granted to Placer Pacific and construction of the mine began in 1988. On 27 July, 1989, Prime Minister Rabbie Namaliu officially declared the mine open.

The Misima mine is a conventional open-pit mine with mineable reserves of approximately 55 million tons grading 1.38 grammes/ton gold and 21 grammes/ton silver (cutoff value of 0.7 grammes/ton gold). The mine opened with a planned production rate of 15,000 tons/day and an expected mine life of 10 years. The capital expenditure for the mine was approximately US$150 million and production over the life of the mine is estimated to be 77 tons of gold and 1,175 tons of silver.

3. Positive impacts of Misima mine

Not surprisingly, the introduction of a mining venture the size of the Misima mine is having a profound effect on the peoples, culture and environment of a remote area such as Misima Island. Without doubt, the development will have numerous positive effects both for the nation and for the Island. Among the potential benefits from the mine, as listed by Davies, p.135 (1983), the most obvious are:

- cash flow to government from tax and/or equity earnings;
- increase in exports;
- increased employment and disposable income;
- improved health care and education;
- improved infrastructure;
- increased level of skills in workforce;
- ancillary and catalytic development; and
- diversification of the economy.

The Misima mine is somewhat unique in that the Misimian people, from the outset, requested that significant benefits flow to the community at large, but not at the expense of changing their way of life, culture or values. To achieve this, the mining company undertook a number of initiatives (Barwick, 1995). It constructed and/or upgraded island roads in order to allow all employees to continue to live in their home villages and within their customary society. It provides a bussing service to transport employees to and from work. The company recruits only

Misimians for the national component of the workforce. It established comprehensive training and skill development courses for Misimian recruits, and it built community infrastructure in locations to benefit the community beyond the life of the mine. The company developed long-term infrastructure, including an air strip and air terminal, upgraded the hospital, built a new police station, developed two ports, linked telecommunications to the national system, created housing subdivisions and built school classrooms. Finally, it developed and supported an active business development program.

In addition to the above, the mining company undertook three other activities which were of particular importance with respect to the mine but which also should be highlighted with respect to any mining venture in developing countries. First, priority was given to the employment of the most affected traditional landowners while also ensuring that employment was spread across the Island and partially into the surrounding archipelago. This ensured that all Misimian clans had some role in and benefits from the project. Second, a social monitoring committee was created, composed of representatives from the mine, police, church, landowners, Misimian women's groups, district and provincial governments and the national government. Through this committee the social impact evolution was monitored through project construction and operations: changes were identified and remedial action was taken as required, thereby preventing problems from growing. Third, the mining company arranged with the national government for a proportion of the project's income tax revenues to be spent on infrastructure in the Misima district on approved items such as bridges, schools and social services.

4. Negative aspects of the mine development

The above benefits have to be weighed against the local adverse effects, which although substantially mitigated, impacted on the local population. These included the following:

- disruption of the physical environment;
- disruption of social organization and cultural values;
- inequitable revenue distribution;
- high inflation or even hyperinflation;
- unresolved issues of land access/loss of compensation;
- adjustment problems of relocation and migration;
- increased costs to government of providing services; and
- loss of control by local people over major decisions.

As is often the case, and despite the best efforts of the mining company, many of the social, cultural and environmental costs of the mine were not readily apparent until development had begun. At this time the local people began to experience first-hand the unexpected change in their lifestyles owing to sudden participation in the cash economy, the abrupt influx of outsiders needed to construct and operate a mine, environmental damage due to waste rock and tailings discharges, and even dietary imbalances as food prices skyrocketed.

5. New and additional issues

The successes, failures and continuing efforts of government, individuals and the mining

company to identify, resolve, mitigate and effectively deal with the impacts of the mine make the Misima mine-Misima Island an ideal system for study and analysis This is, however, not to say that all issues are confined to direct impacts of the mining activity.

Indeed, sporadic unrest among landowners on Misima Island suggests that they continue to perceive the benefits and costs of the mine differently from the national and provincial government authorities. In particular, the division of royalties between the Milne Bay provincial government and landowners has continued to pose a challenge for the Papua New Guinea national government.

In February 1990, negotiations between the national government and the provincial government and the local landowners did, however, prove successful, as the three parties agreed on a number of proposals concerning revenue distribution, including an increase in landowners' royalties from 20 per cent to 30 per cent, 250,000 Kina annually for infrastructure development, and a 500,000 Kina loan guarantee to be converted immediately to an interest-free loan to landowners (*Papua New Guinea Times*, 1990). However, the landowners' association is still upset about the way the national government and Placer began its operations at Misima, since they believe, as Mr. Stanley Nigu (President of the Landowners' Association) stated, that after the national government granted the mining lease "they couldn't care less about the landowners in terms of development".

Although active exploration in and around the Misima mine is defining additional ore, looming on the horizon (four to eight years' time), is the closure of the mine . In many ways this will be the true test of success in achieving the overall objective of the people of Misima Island, i.e. having the mine, reaping the profits and upon its closure returning to the traditional ways of life. At present it would seem that this objective will be largely met. Nevertheless, there can be no doubt that the social, cultural and environmental elements of the island and its people have been changed: time will tell to what degree.

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The Whitehorse Mining Initiative: A case study in partnerships

C. George Miller

1. Introduction

The Whitehorse Mining Initiative (WMI) was a Canadian experiment in building partnerships around the mining industry. The WMI was a two-year national consultation (1992-1994) designed to lead to a new strategic vision for the Canadian mining industry. It was proposed by the mining industry and supported by the federal, provincial and territorial ministers of mines.

Direct participants in the consultation numbered around 150, drawn from six major groups: mining industry executives; federal government officials from several ministries; government officials from several provinces and territories, representing mainly mines and environment ministries; trade unions representing mining workers; non-governmental environmental organizations and Aboriginal peoples. These six groups were identified as the prime "stakeholder" groups, since each had a stake in the outcome, namely the future of the mining industry in Canada. As the negotiations proceeded, these direct participants also involved a large number of others in their individual constituencies, so that any decisions reached within the Initiative would reflect a wider consensus among the major stakeholder groups.

At the end of the consultation or negotiation phase, several consensus documents were produced. These contained the principles, goals, objectives and recommendations which had been agreed by the participants. At that time, the temporary organization which had supported the negotiations was dissolved. It became the task of each major stakeholder group to try to implement the agreed principles and to work together to attain the agreed goals.

This paper will describe the WMI process, the products, and the efforts that are being made to implement the findings.

2. The Canadian context

Several unique features of Canadian geography and demographics are relevant to this case study. There are striking similarities between Canada and some developing countries with respect to social and cultural issues that arise in the course of mineral development.

Everyone knows that Canada is a big country with a small population. It is also true that the population is very unevenly distributed. Most Canadians live in a narrow band along the southern border, next to the United States. Except for a few urban agglomerations, the remaining land is thinly populated. Most mining activities are carried out in these northern regions.

Many local communities in northern regions are composed of Aboriginal people, whose traditional economy and lifestyl includes hunting and gathering rather than agriculture. Because these traditional Aboriginal activities range over large areas, a given band will have an affinity for, and a history of use of, a large area around its community. Most Aboriginal communities have had very little experience of industrial development. Education levels are relatively low, and employment opportunities are rare. Social and health problems are common.

Some Aboriginal groups have successfully asserted their rights to gain ownership and control over very large tracts of land. These land claims, when settled, will stimulate economic development through the transfer of land and financial resources to the Aboriginal people. They will also create new governing structures and rules for mining activities.

In northern Canada, therefore, the presence of communities which have little experience of industrial development, but a strong affinity for the land, create conditions similar to those in certain developing countries. The process of mineral development faces many of the concerns with respect to social and cultural impact that are the norm in developing countries.

3. Situation before the WMI

It is necessary to describe the situation that faced the Canadian mining industry up to 1992, before the Whitehorse Mining Initiative was undertaken. A two-year study of Canada's business climate for mining, completed in 1992, revealed several problems which made it difficult for Canada to attract exploration dollars. After reaching a peak of over Can$ 1 billion in 1987, exploration spending fell steadily to less than half that figure by 1990. Capital investment in mining, as a share of all investment, had also fallen by half. At the same time, Canadian companies were increasing their exploration and investment activity outside Canada, notably in Latin America and Asia.

The flight of capital from Canada had many causes. For one thing, there had been economic and political reforms in some countries (such as Chile, which was known to have superior mineral deposits), thus increasing companies' interest in going there. This factor was beyond Canada's control.

But other, domestic problems made Canada a less attractive target. One problem was arbitrary land-use decisions, the most notorious one being in respect of the Windy Craggy deposit. This project was in the permitting process after about Can$50 million had been spent on exploration. It was halted when the government of the province of British Columbia prohibited further development and created a park in the region. Compensation was not paid until several years later.

At around the same time, the federal government and the provincial governments agreed to accelerate the creation of parks and other protected areas. This would substantially reduce the land available for exploration, and the mining industry was not consulted in the selection of land to be protected. Another factor was the large number of unsettled Aboriginal claims, leading to uncertainty in mineral tenure. The claims of Aboriginal people in Canada were based on traditional use and occupancy of the land. Since it is possible for two Aboriginal groups to hunt over the same land, these claims often overlapped, to the extent that in British Columbia the area claimed exceeded the total area of the province.

Over the past few years, both levels of government have rapidly introduced much new environmental regulation, without coordinating their efforts. This has increased companies' costs and led to project delays.

In summary, the business climate was marked by an atmosphere of uncertainty and the threat

of unpredictable and arbitrary decisions. This unsatisfactory situation arose in part because industry had little credibility or support among the Canadian population, most of which lives in cities remote from mining activities.

4. Reasons for undertaking the WMI

Why did the mining industry suggest a national consultation on the future of the industry? It is unusual for an industry to seek advice from stakeholders, including trade unions and environmental activists. Why did we ask outside groups to help design our strategic plan?

The industry felt it would have a better future in Canada if important groups in Canadian society understood it better and were more familiar with it. Building on understanding, we hoped to gain allies and, where possible, form partnerships with some interest groups that have traditionally been opposed to mining. In order to build these alliances and partnerships, the industry needs not only to be understood, but it also needs to understand other groups' attitudes and values.

In the long run, we hoped to improve the policy climate so that government policies and legislation would be more favourable. We hoped that our new allies and partners would support the necessary changes in policy.

We felt that by working cooperatively with the stakeholders to develop a new strategic vision for the mining industry, companies would learn what is important to our partners in society. We could then use this knowledge to guide future industry behaviour and tactics. This might lead in some cases to different operating practices and would encourage companies to build closer ties to their own communities, for the benefit of all.

5. The WMI's objective

Early in the WMI consultations, the participants agreed on the following objective:

> "To move towards an economically, socially, environmentally sustainable and prosperous mining industry, underpinned by political and community consensus."

In adopting this objective, all participants in the WMI were undertaking to build an industry which is sensitive to environmental and social concerns, which is economically viable and prosperous, and which enjoys the support of government and the community.

No one in the mining industry suggested this slogan. It was coined by a leading trade unionist. That fact underlines the surprisingly high degree of commitment which all participants felt to the task of revitalizing the mining industry for the benefit of Canada.

6. Overview of the process

This section will briefly describe the WMI consultation process. Further detail on the substance of the consultations will be provided in the following sections. As mentioned, the

suggestion for a national consultation was motivated by business problems related to government policy. The initiative was suggested, promoted and driven by the mining industry. The consultation was a two-year process. The federal and provincial mines ministers agreed to sponsor the project at their annual conference held in Whitehorse, September 1992 (hence the name given to the initiative). The consultations were completed and the Leadership Accord signed at the mines ministers' conference in Victoria, British Columbia, September 1994.

In addition to industry and government personnel, the consultations involved two national trade unions, non-governmental environmental organizations, and the four national organizations of Canada's Aboriginal peoples. Throughout its life, from the very earliest moments, the initiative was managed cooperatively by all stakeholders. All management decisions were taken by committees, which had a balanced membership of all the stakeholder groups. While this was sometimes a difficult process to manage, it maintained the goodwill and commitment of all those involved.

The costs of the consultation, amounting to Can$ 1.3 million, were met by industry and by the federal and the provincial governments.

7. WMI organization

The diagram in figure 1 is not a normal organization chart. It shows the main constituent bodies which were involved in the WMI. Note that each organizational unit interacts with all the other elements. While each unit had a separate function, there were no lines of authority between them. None of these groups had authority over the others: each was autonomous in its own sphere.

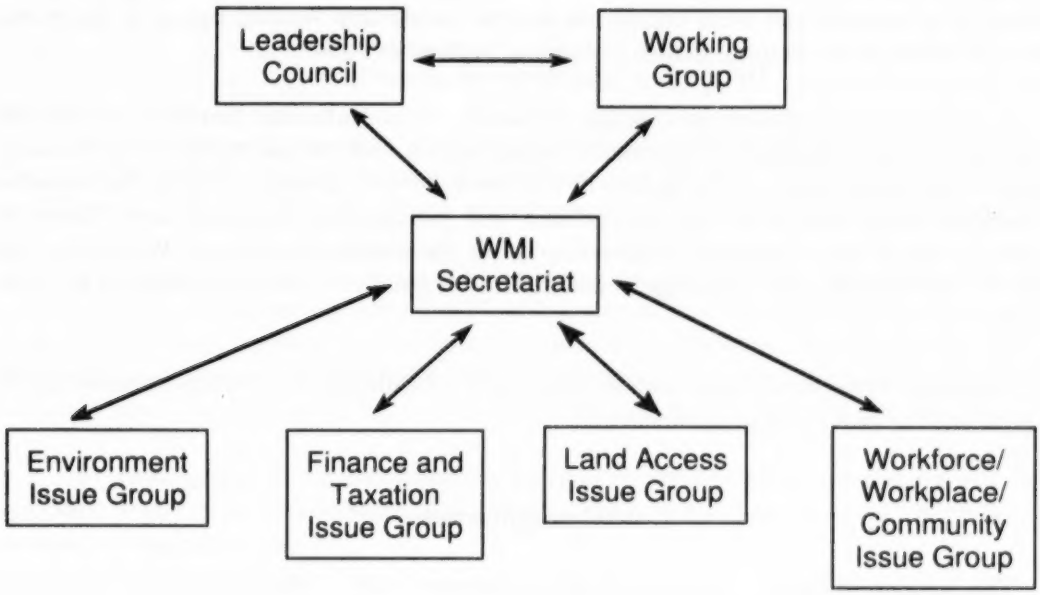
The diagram actually illustrates two types of structure, each with a different function. One structure, consisting of the Leadership Council and the four Issue Groups, provided the forums or "tables" for discussion of the substantive issues. The other structure, consisting of the Working Group, the Communications and Implementation Committee, and the Secretariat, existed to manage the process and support the groups involved in issue discussions. All these bodies were temporary: they were abolished at the end of the consultation. The following sections describe each group and its functions in more detail.

7.1 Substantive issue-discussion structure

The **Leadership Council** consisted of over 40 members:

- Federal and provincial/territorial mines ministers (13)
- Chief executive officers of leading mining companies (7)
- The elected leaders of Canada's four national Aboriginal organizations (8)
- The elected officers of the two leading mine workers' unions (5)
- The elected heads of leading non-governmental environmental organizations (7)
- Independent "eminent persons" (3). One of these was a respected academic economist with a long record of public service; one was a former university president, currently the Chairman of the National Round Table on Environment and Economy; and the third was a well-known professor of environment.

Figure 1. WMI organization



The function of the Leadership Council was to provide credibility and support to the whole undertaking. Its members were serious and influential people. Their visible support was very important to the success of the undertaking. In practical terms, they were required to agree on a set of high-level principles, to make an effective commitment to the WMI outcomes, to implement the agreed changes, and through example, to lead others to implement the findings.

The Leadership Council held six to seven one-day meetings over the two-year period. It negotiated and approved the principles and goals contained in the Leadership Accord. These principles are similar to those contained in the Issue Group reports, but at a more general level. All decisions and agreements were reached by consensus of the whole Council.

Four **Issue Groups** were created, each with between 20 and 30 members drawn from all the stakeholder groups. The stakeholders themselves, at their first major meeting, identified a large number of issues and gathered them into four groups of related issues. These were the final groupings:

- *Environment Issue Group*: environmental assessment, environmental management during operations, mine closure, streamlining regulation, community liaison;
- *Finance and Taxation Issue Group*: securities regulation, taxation and other charges, user fees, financial aspects of mine closure;
- *Land Access and Land Use Issue Group*: protected areas, mineral tenure, land use planning processes; and

- *Workforce/Workplace/Community Issue Group*: stability of communities, health and safety regulation, mobility of workers, training and skills development.

Each Issue Group comprised members from each of the six stakeholder groups - that is, the federal government and the provincial governments, industry, trade unions, environmentalists, and Aboriginals. Members tended to be experts in the group's particular field. It should be noted that all groups dealt with the relevant aspects of Aboriginal peoples' concerns. These included such items as settlement of land claims, interim benefits agreements, participation in the mining industry, jobs, and business opportunities.

Each Issue Group worked intensively in six to ten meetings of two or three days' duration over a period of 18 months. Each one negotiated a report which analysed the issues in depth, taking into account the views of all stakeholders. The groups also reached agreement on certain principles, objectives and recommendations, all of which were agreed by consensus of the whole group.

7.2 Process support and management structure

The **Working Group** was charged with planning and directing the whole process. It developed a budget, raised funds from the sponsors, made all management decisions regarding the process, and directed the secretariat. It did not enter into any discussion of the issues. Again, it was a balanced management-level group, representative of all the stakeholder groups.

The **Communications and Implementation Committee** had a membership drawn from all the other bodies. It consisted of persons who were particularly expert in communications, as well as in policy, and negotiations. The Committee:

- Planned communications activities. This involved decisions about the format of reports, involvement with the media, etc.;
- Produced initial drafts of the Leadership Accord. This involved producing reports that recorded the progress of negotiations within the Leadership Council; and
- Facilitated the final intensive negotiation of the Accord. In the closing stages of negotiations, the Leadership Council delegated the task of negotiating a final text to the Committee.

The **Secretariat,** consisting of three to four persons, was the only full-time staff devoted to the WMI. The Secretariat handled all aspects of the routine work of the initiative. This involved management, administration, including budgeting and controlling costs, arranging all meetings of all the groups, and writing draft Issue Group reports.

8. WMI products

As indicated earlier, two sets of hard reports emerged from the WMI. These were the WMI Issue Group reports, and the WMI Leadership Accord.

8.1 WMI Issue Group reports

The Issue Groups worked hard on their assignment. Their reports were the product of intensive negotiations occupying at least 20 days for each participant, spread over about 18 months. Every word in all the reports was negotiated, the final wording representing the consensus of all the participants in each group. Because of participants' differing attitudes and values, negotiations were often emotionally charged. Notwithstanding the difficulties, all participants stayed with the task and showed strong commitment to achieving agreement.

During the negotiations, individual negotiators often consulted their principals (that is, the leaders or members of the constituency which the individual represented). This was necessary in order to gain legitimacy and build consensus within stakeholder constituencies.

Each Issue Group report contains a detailed analysis of the issues, as well as a set of principles, objectives and recommendations for each issue. All the Issue Group reports together contain a total of 170 recommendations addressed to all stakeholders.

During the long and intensive Issue Group discussions, a high degree of trust and understanding was reached among the individuals involved. As a result, some of the agreements are radical, as compared with today's situation. For example, environmental representatives on an Issue Group may have agreed with an industry position which the whole environmental constituency could not support. Also, some of the recommendations cannot be carried out without extensive changes in industry or government attitudes and practices. For that reason, although the Issue Group reports represented a consensus of all stakeholder representatives, they could not be endorsed by the Leadership Council as a whole. However, they are a rich source of ideas for future change.

8.2 WMI Leadership Accord

The most visible and important product of the WMI is the Leadership Accord. It is a product of extensive negotiation and represents a consensus of the individuals who sat on the Council. As they were all influential leaders in their own fields, the Accord carries a great deal of moral weight.

The printed version of the Accord is a substantial document of 34 pages. It contains 16 principles and 69 goals supporting the principles. These principles and goals fall into several themes, ranging from *Addressing Business Needs* to *Maintaining a Healthy Environment*.

The Accord also contains a shared "Vision", which is very similar to the WMI objective agreed earlier in the process:

"Our Vision is of a socially, economically, and environmentally sustainable and prosperous mining industry, underpinned by political and community consensus"

In signing the Accord, Council members made an impressive commitment to support the vision, principles and goals publicly, and to promote their implementation. This commitment was signed by almost all the members of the Leadership Council, with very few abstentions.

9. WMI implementation

Agreement on principles means little unless action follows. If the WMI vision, principles and goals are to become a reality, there is a need for all stakeholder groups to take appropriate action in support of the agreement. Those who have the most power, and the most responsibility, to affect the future of the industry are the two levels of government and the industry itself. But there were other partners in the enterprise, namely labour, Aboriginal peoples and environmental groups. They agreed to promote the principles in any way they could, and so they also have a responsibility to take action. This section of the paper reviews actions taken so far by the different stakeholder groups in implementing the WMI.

9.1 Federal government

In December 1994, the federal government launched a regulatory reform initiative. One of the WMI principles had called for a simplification of the industry's regulatory burden. Although mining was not the only sector that would be covered by the reforms, the WMI was given as the reason for making mining one of the priority sectors.

To give effect to other issues arising from the WMI, the federal government has prepared a new mineral policy founded upon the concept of sustainable development. We believe that this document will support the industry's needs. In addition, the Minister of Natural Resources has established an advisory group to guide her in further steps in implementing the WMI.

9.2 Provincial governments

Two provinces, namely Ontario and British Columbia, have undertaken multi-stakeholder consultations along the lines of the WMI to develop an action plan within their own jurisdictions. Other provinces have initiated their own regulatory reform agendas.

In British Columbia, land use planning for protected areas is a consultative process involving industry in the decision-making process. Several provinces have initiated policy reviews for mining and environmental regulation.

9.3 Mining industry

The mining industry itself has taken several steps which will help to implement the agreed WMI principles and goals. The Mining Association of Canada has issued a revised and updated environmental policy which all member companies must endorse as a condition of membership. Supporting the policy is a set of environmental management guidelines. Together with the mining trade unions, the industry has established a cooperative training council to take action on the agreed goals.

In the areas of land use and land access, the industry has begun the development of a strategy which will assist in the conservation of nature and biodiversity, while at the same time improving the industry's access to the land required for mineral exploration and reducing uncertainty.

The industry has developed some projects jointly with the environmental movement. One of these is a joint seminar on the scientific principles governing the selection of protected areas.

In addition, the industry is using WMI to influence the behaviour of governments and other groups. We are calling on those other signatories to the Leadership Accord to respect the WMI principles and work more cooperatively with us. Finally, the industry is prepared to participate in further consultations on any of the issues which were part of the WMI or related to it.

9.4 Other stakeholder groups

To some extent, the other stakeholder groups continue to work positively with the industry to realize the WMI principles. For example, the trade unions are cooperating with industry leaders in the joint training council mentioned earlier. Similarly, certain environmental groups continue to work with industry on joint projects of benefit to both the economy and the environment.

One disappointment is that Aboriginal organizations have done relatively little to communicate the findings of the WMI to their members and to implement its principles and goals within their own communities. There is one Aboriginal association (the Canadian Aboriginal Minerals Association) which promotes mineral development and improved understanding between the mining and Aboriginal communities.

In the policy area, all these groups (labour, non-governmental environmental organizations and Aboriginals) are using the WMI principles to influence the behaviour of industry and government. Most of the stakeholders are also participating in further consultations at the provincial level.

10. Other WMI outcomes

This paper has dealt with the tangible products arising from the Whitehorse Mining Initiative and the efforts that are being made to implement its principles in the real world. But there have also been intangible benefits from the exercise.

The WMI has led to continuing contacts between those who participated in the consultations and a much higher degree of dialogue, understanding and communication among them. This illustrates that in the long run, the process of trying to reach agreement is as important as any tangible product. Industry has achieved one of its objectives by gaining improved political and community backing. Moreover, the WMI has increased the industry's credibility and perceived trustworthiness, at least among decision makers.

One unexpected outcome is that the WMI has attracted international attention. It seems that many people are looking for ways to reduce controversy and make mining projects more acceptable to the community in many parts of the world. We have been asked to describe the WMI process in the United States, Australia, Brazil and, of course, Indonesia. One of the greatest compliments was paid by certain institutions in South Africa. With support from the Canadian International Development Agency, a major consultation among mining stakeholders has been launched in that country.

This wide international interest is encouraging, all the more so if it denotes a growing belief that inclusive processes, in which all affected interests may be heard, are an important way of preventing conflict and increasing everyone's satisfaction with the process of mineral development.

11. Conclusion

The Whitehorse Mining Initiative was a difficult but rewarding experiment in building partnerships. The consultations came to a successful conclusion in that an Accord was signed, incorporating large areas of agreement at the level of principles and objectives. This success is attributable to the hard work of the individuals involved. It also demonstrates that partnerships can be built among those with very different attitudes and values, provided that efforts are founded on mutual respect and honest communication.

Although the Accord was signed more than two years ago, its true effects are still emerging. Some people are still learning about the WMI for the first time. Others are diligently trying to move the public agenda forward along the agreed lines. While the long-term effects are still difficult to predict, I am optimistic that the benefits will continue to grow.

ANNEX

Asian/Pacific Workshop on Managing the Social Impacts of Mining
Bandung, 14-15 October 1996
Workshop programme

14 October 1996

Opening ceremony:	Report by Organizing Committee, Dr. Hikman Manaf, Head of Manpower Development Centre for Mines
	Address by Olle Östensson, UNCTAD
	Opening address by Dr. Kuntoro Mangkusubroto, Director General of Mines, Ministry of Mines and Energy, Indonesia
Session I:	A brief background on social issues and mining, Olle Östensson
Session II:	Bougainville: A case study on social impacts, Dr. Allen L. Clark
Session III:	Analysing social impacts, Kathleen Anderson and Dr. Jennifer Cook Clark
Session IV:	Namaqualand: A case study on impact mitigation, Olle Östensson
Panel discussion	

15 October 1996

Session V:	Designing solutions for social impacts, Dr. Jennifer Cook Clark
Session VI:	Misima: A case study on social impact planning, Dr. Allen L. Clark
Session VII:	Implementing solutions, Dr. C. George Miller
Session VIII:	The Whitehorse Mining Initiative: A case study in partnerships, Dr. C. George Miller
Panel discussion	